THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

COMPUTERWORLD

$2.00 A COPY; $44/YEAR | APRIL 15, 1985 | VOL. XIX, NO. 15

3,000 micros New York Life sets up its agents/**22**

Hybrid vigor Chip technology tests out/**89**

In Depth Fourth-generation language products **Follows 60**

Prime's link to MCI gives local bypass

First in a four-part series on how individual companies are benefiting from communications bypass.

By John Dix
CW Staff

NATICK, Mass. — Prime Computer, Inc. migrated most of its long-distance communications traffic from AT&T to MCI Communications Corp. more than a year ago and, in doing so, implemented a bypass system that reduced its dependence on the local telephone company.

Prime is headquartered in this suburb west of Boston, near its research and development complex and multiple manufacturing plants, which are located in surrounding towns. A proponent of local bypass, the minicomputer manufacturer has long used private microwave voice/data links for communication between its many facilities.

In October 1983, the company took local bypass one step further. It dropped AT&T, selected MCI as its primary long-distance carrier and installed a direct microwave link between its headquarters and MCI's access point in Boston, according to Bill Hawkins, Prime's manager of corporate telecommunications.

All long-distance carriers maintain access points within the Local Access and Transport Areas they serve. Latas are geographic areas that determine whether traffic is carried by a local or long-distance carrier. The former Bell operating companies can only carry traffic within Lata boundaries, not across them. All traffic flowing between Latas is funneled through access points of the various long-distance carriers.

See **BYPASS** page 11

Low end pumped up

Stratus unveils entry-level CPU

By Donna Raimondi
CW Staff

MARLBORO, Mass. — Stratus Computer, Inc. unwrapped an entry-level, fault-tolerant computer that is upgradable to all other members of the Stratus/32 product family.

The basic Stratus FT250 contains 4M bytes of main memory. Each major component of the systems hardware has a twin so that the system has a total of 8M bytes of physical memory, accordng to the vendor. The hardware also includes two 143M-byte disk drives, one 1,600/3,200 in./min tape drive and a fault-tolerant communications subsystem.

The FT250 — geared to business applications such as banking and broker-

See **STRATUS** page 6

Tandem releases Nonstop EXT

By Jeffry Beeler
CW West Coast Bureau

CUPERTINO, Calif. — Tandem Computers, Inc. today introduced an entry-level processor that reportedly allows the company to serve its users in branch offices as well as in their corporate headquarters for the first time.

In processing power, the Nonstop EXT roughly equals the firm's existing Nonstop II CPU, according to Tandem sources. But in its environmental needs and for its targeted users, the just-announced EXT reportedly differs sharply from the Nonstop II and Tandem's top-of-the-line TXP processor.

The entry-level EXT extends Tandem's product line downward because it reportedly needs no protected environ-

See **TANDEM** page 6

TOP OF THE NEWS

Mass layoffs and plunging profits bear witness to the slowdown in the computer industry that has affected several major vendors. **Page 4.**

■

Sperry unveiled a relational data base machine that is said to integrate a Britton-Lee processor and one or more Sperry mainframes. **Page 6.**

■

Does e-q-u-a-l a-c-c-e-s-s spell trouble for AT&T? Figures show that some customers are switching to AT&T's competitors in areas where equal access has been implemented. **Page 10.**

■

When E. F. Hutton talks about designing a computer room, experience plays the leading role. **Page 19.**

■

Honeywell unwrapped a turnkey videotex system based on its DPS/6 mini. **Page 81.**

■

Lotus will acquire Software Arts and its Visicalc package in a deal that will also bring Visicalc's authors to Lotus. **Page 89.**

FYI

Changeover creates taxing delay

IRS system upgrade slows processing of tax returns

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — It's a case of "hurry up and wait." You struggled, fumed and fretted your way through your federal tax return to meet the April 15 deadline, but you may have a long wait for that refund check this year.

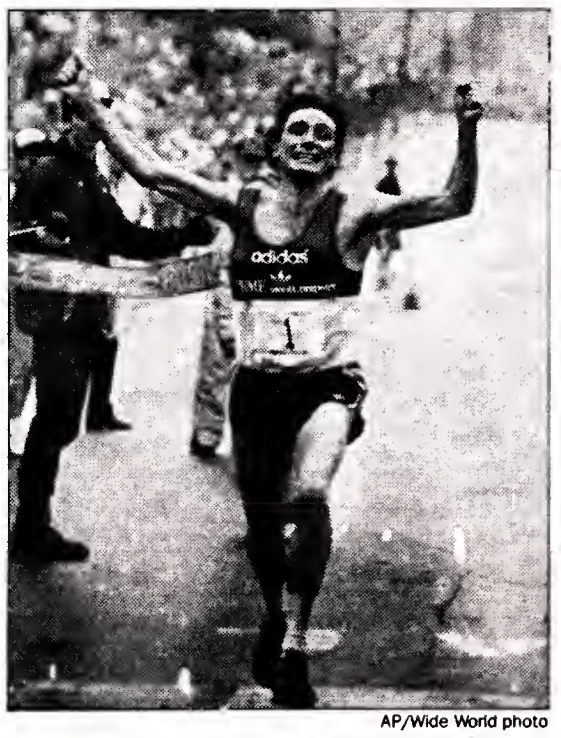
The wait is the result of a modernization program that replaced 1960s vintage Honeywell, Inc. 2050A and Control Data Corp. 3500 processors with Sperry Corp. 1184 multiprocessors and that converted 1,500 Internal Revenue Service programs — 3.5 million lines of code — from assembly language to structured Cobol.

A wide variety of hardware and software problems have meant that, as of March 29, the IRS had processed 26% fewer individual tax returns than it did at the same time last year, according to IRS spokesman Steven Pyrek.

Consequently, some taxpayers will get their refund checks four to six weeks later than usual. Although the IRS runs the risk of having to pay 13% interest if refunds are not sent by June 1, Pyrek said the computer centers are steadily reducing the backlog and are processing refunds first to avoid paying interest.

In a speech last month, IRS Commissioner Roscoe L. Egger Jr. expressed his frustration with the computer problems in the Service Center Replacement System: "With any computer [breaking-in] period, there are software and hardware problems and personnel adjustments. Machines break down. People push wrong buttons. . . . The results are terribly frustrating for taxpayers and us."

See **REFUND** page 8



AP/Wide World photo

Marathon man

Honeywell has an 11-year veteran of the Boston Marathon who has never run in the race, unlike last year's winner above, Geoff Smith. Story page 16.

NEWSPAPER

NEWS

Logic bomb brings agency's DP operations to standstill

By Kathleen Sullivan
CW West Coast Bureau

LOS ANGELES — A saboteur's logic bomb, which paralyzed the central computer at the city Department of Water and Power (DWP) here for five days, did not destroy any data. However, it did "rearrange" information in the department's IBM mainframe, according to the Los Angeles Police Department.

"Apparently, the person who programmed the logic bomb into the computer wanted to create some havoc," said police Lt. Fred Reno, who is in charge of the Police Department's computer fraud unit.

Reno described a logic bomb as a software program designed to destroy, remove, replace or rearrange information stored in a computer at a given date and time.

The investigation into the incident is continuing, Reno said. To date, no criminal charges have been filed, but Reno said the Police Department is "considering some possible suspects."

The problems began one Monday morning in early March when the DWP's IBM 3081 began crashing continually, said Robert Giffrow, director of management services at the department. "We had brought the system up, but every time it was used, it went down," he said.

Giffrow, citing the sensitive nature of the investigation, would not elaborate, except to say the management services department had so far discovered that an as yet unidentified person had planted a logic bomb in one of the DWP's software programs. "We know it was deliberate sabotage," he said.

Steve Hinderer, DWP's director of public affairs, described the incident as an inside job. "We feel someone from the inside, who knew the system well, got in and brought the system down," he said.

> *'We know it was deliberate sabotage.'*
>
> — Robert Giffrow, Department of Water and Power

Giffrow said it took 20 people "the best part of a week" to track down the problem and bring the system back up to stay. During that time, DWP personnel were unable to enter orders for new water and electricity connections.

Although Giffrow said he did not know what security precautions might have prevented the alleged saboteur from placing the logic bomb in the system, he said the department will be rethinking its security measures as a result of the incident.

The cost of making up for lost production time will be substantial, he added. The DWP's on-line system handles data for personnel transfers, promotions and payroll deductions, inventory transactions and purchase orders for equipment, as well as requests for new power connections.

Reno said that, if arrested, the suspected saboteurs will be charged under a state penal code section that covers tampering with computers.

Police hit high-tech bookies

By Clinton Wilder
CW Staff

BOSTON — A multimillion-dollar computerized bookmaking operation uncovered here last week was possibly based on telephone banking technology, according to one computer crime expert.

The national sports betting syndicate, described by law enforcement officials here as the most technologically sophisticated operation ever uncovered in Boston, included the use of personal computers, telephone call diverters and scramblers.

Jean Troy, a computer security specialist at the National Bureau of Standards in Gaithersburg, Md., said the bookmaking system probably took wagers from bettors entering bettor codes and wagering information on Touch-Tone telephones, much as a telephone bank customer would request account information or fund transfers.

"It's a fairly straightforward program," Troy said. "[People] dial up and uses Touch-Tones to enter [their] account number. Then a voice response system gives instructions for entering the information — codes for a specific racetrack, race and horse, for example. It would be keyed around a data base management system to call up various canned voice modules."

Boston investigators refused to comment on the types of computers involved in the operation but did describe call diverting and voice scrambling devices confiscated in a 1984 raid in East Boston. The equipment was allegedly used to transfer bettors' calls to the downtown Boston computer operation to avoid having the calls traced. "The individual bookie or bettor would be talking directly to the computer that records the bet," Troy said.

Published reports said the operation's leader allegedly purchased computer and call diverting equipment from a suburban computer retail store, Computer Showcase of Norwood, Mass.

The store's owner was one of eight arraigned on April 9 for the charges, which included illegal gaming, conspiracy, money laundering and state tax evasion.

Tell us what's news with you

Hard as we try to give our readers the most complete information, some stories never reach us.

Are you involved in an unusual application of DP technology? Have you implemented successful cost-cutting strategies? Is something in your DP shop not working as designed? Know any unsung heroes?

If so, we'd like to hear from you. *Computerworld* has established a reader hot line for information regarding items of interest to the computing community. Call us toll free at (800) 343-6474. Ask for Donovan White, assistant managing editor.

Report to eye DBMS issues

The increased use of multiple data bases and vendor moves toward integrating applications around a central data base management system are two factors that give DP managers something to ponder when considering DBMS.

The June *Computerworld* Special Report will focus on DBMS and the continuing evolution of that market. The report will also cover issues of purchasing and maintaining the corporate data base.

Contributions to the Special Report are welcome and should take one of two forms: a tutorial article, discussing an issue or trend, or an application story, outlining a particular user firm's experience with a DBMS.

Articles must be typed, double-spaced and range in length from four to six pages. Artwork is welcome.

Authors should include brief biographies and telephone numbers.

The deadline for submissions to the Special Report is May 5.

If you have a story or questions, send them to Janet Fiderio, Special Report Editor, *Computerworld*, Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

NEWS SUMMARY

IBM reported that first-quarter profits were down 18% from one year earlier and more than 50% below the fourth quarter of 1984/**4**

U.S. trade associations had assorted reactions to an announced plan by Japan's prime minister to open the Japanese market to foreign imports/**4**

Sperry unwrapped a Britton-Lee-based relational data base processor system for its 1100 mainframe and IBM mainframes/**6**

Competitors are putting it to Ma Bell in the scramble for new equal-access customers, but AT&T still may get a majority of those customers, by default, if they do not choose a carrier/**10**

Cullinet users have said the Information Center Management System is little more than window dressing for existing products/**12**

Texas Instruments' Personal Consultant expert system development package gets good reviews/**13**

A firm's publishing division staged a data center disaster to test its backup procedures/**14**

An Arizona city government has taken a novel approach to implementing office automation from the top down/**15**

The name of Honeywell's marathon man may not be on the sports page, but he will be running the computerized results system for the 11th consecutive year at today's 89th annual Boston Marathon/**16**

A motorist in Alaska was mistakenly ordered to spend a night in jail because of an improperly programmed computer system/**17**

The city of Atlanta decided that a top-down approach was needed to determine its data processing priorities/**18**

E. F. Hutton listened to its own experience when it built a new computer room/**19**

The drive is on at an insurance company to get its agents to buy individual desktop systems/**22**

An Ohio pharmacist has increased the efficiency and profitability of his store with the aid of a mini-based pharmacy software system/**26**

A 3M distribution center is using a voice-recognition system to move raw materials, parts, tools and assemblies to their final destinations faster/**30**

Some gas station customers in Pittsburgh are using credit cards that automatically register from point-of-sale terminals to a bank's ATM network/**31**

An IBM 3276 terminal emulation package has provided an insurance company's agents with a means for better use of mainframe data/**34**

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SUSPENSE

How did IBM's rookie sort (Rel 7.0) do in its first meeting with "Lefty" SyncSort? Read all about it!

or Call (201) 568-9700.

Get the inside scouting report.

It is one of those historic moments in the Annals of Sort! The very first appearance in competition of IBM's new DFSORT, Release 7, in the tough-as-nails MVS/XA League. Will the kid be able to live up to his advance press notices?

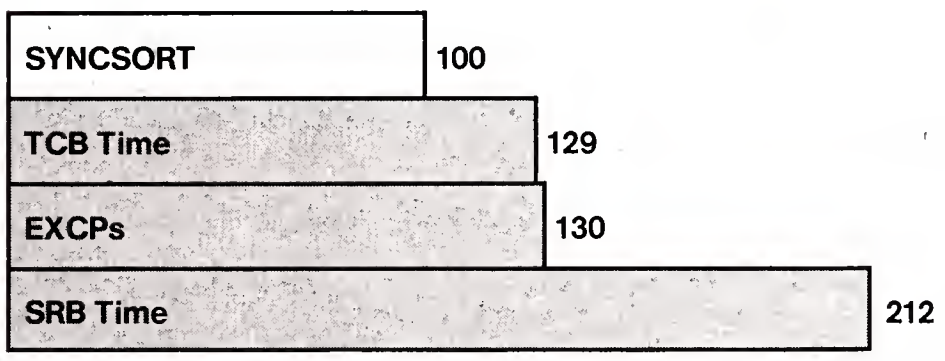
Confidently DFSORT7 strides to the plate... knocks the dirt out of his spikes... hitches up his britches... raises his sort assists.

Then, as sorting fans everywhere gasp in amazement, he lifts his arm lazily and points toward the centerfield flagpole, thousands of bytes away. The kid is going to try to emulate Babe's mighty homerun shot!

Moments later, SyncSort winds up... a curving white blur is seen... and... and...

There is no joy in Armonk! DFSORT7 struck out every time it came to bat against the latest release of SyncSort (Release 2.SE) in a recent series of MVS benchmark tests. (In sorting, as in most other forms of human endeavor, it's a long way from *baby* to *Babe*.)

The bar charts below tell the story more eloquently than we can:



That didn't surprise us too much. **After all IBM isn't known for its sorts... and we're not known for our computers.**

We stick to what we do best. Maybe some day they will too. But in the meantime, you're faced with a choice of sorts. You can use their sort, which gets the job done (eventually). Or you can use our sort. We're a little faster. (We're also very modest.)

syncsort INC.

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NEWS

IBM quarterly profits slump as slowdown continues

ARMONK, N.Y. — IBM reported April 11 that first-quarter profits were down 18% from the year-earlier quarter and revenue increased by only 2%. On a quarter-to-quarter basis, revenue declined 32.6% from the fourth quarter of 1984 and profits dropped by 54.6%.

The profit decline, which IBM had projected but had not specified two weeks earlier [CW, April 1] marked the first such drop for IBM since the last quarter of 1981.

Revenue for the first quarter from sales, services and rentals was $9.76 billion, up from $9.58 billion in the same quarter a year earlier and down from $14.49 billion in the last quarter of 1984.

Profits were $986 million, down from $1.2 billion a year earlier and $2.17 billion in the fourth quarter of 1984; pretax profits were down 20.6%, and the company paid 23.7% less in income taxes. The company said earnings per share were $1.61, down 18.3% from $1.97 in the first quarter of 1984 and down 54.6% from $3.55 in the fourth quarter.

John F. Akers, president and chief executive officer, said in a prepared statement that revenue and profits were adversely affected by the strength of the U.S. dollar against foreign currencies and by "a slowdown in installation activity in our high-end storage and processor installations as some customers paused to evaluate our recently announced IBM 3090 processor and enhanced IBM 3380 storage devices."

Even if currency rates had remained the same as a year ago, IBM said, first-quarter profits would still have declined 7.1% to $1.11 billion, but revenue would have increased 9.2% to $10.46 billion.

The first-quarter results highlighted IBM's policy in recent years of discouraging rental of equipment. While revenue from both sales and services increased more than 11%, revenue from rentals dropped 36.6%.

Despite the quarterly results, Akers reiterated that IBM is still optimistic about its financial outlook for fiscal year 1985, a view that has been shared by most leading securities analysts who follow IBM. During the first quarter, Akers said, "total worldwide shipments were higher than [they were in] the first quarter of 1984 with substantially all of the growth in the non-U.S. portions of the business." He said the company continued to make significant investments in R&D and plant capacity in anticipation of future growth.

Computervision, Honeywell announce work force cuts

By Peter Bartolik
CW Staff

BEDFORD, Mass. — Computervision Corp. last week dismissed 14% of its worldwide work force in an attempt to bring operating costs in line with an abrupt first-quarter revenue decline.

In a related development, Honeywell, Inc.'s Massachusetts-based Small Computer and Office Systems Group (SCOS) said it will close operations for four separate weeks in 1985 and cut 120 salaried employees from its 4,100-member work force. The company attributed the moves to "a softening in the small computer systems market since the fourth quarter."

Computervision, a manufacturer of computer-aided design and manufacturing equipment, said it dismissed about 950 employees from its 6,800-member worldwide work force. The company also said 50 top executives will take cuts in salaries and bonuses this year.

Computervision had geared operating costs to a projected 1985 revenue increase of 30% to 40% after giving a stellar performance in 1984 when profits increased 35% over the previous year, but that revenue growth failed to materialize, according to spokesman James Barr.

Early last month [CW, March 18], the company unexpectedly projected break-even profits for the first quarter and revised that projection on April 1 to a loss of up to $15.7 million. Instead of anticipated revenue in the area of $160 million for the quarter, the company now expects a 10% to 20% decline from the $121.8 million reported in the first quarter of 1984.

Craig Symons, a CAD/CAM analyst with the Gartner Group in Stamford, Conn., said the general decline in orders experienced throughout the computer industry during the first quarter affected CAD/CAM vendors but to a lesser extent than it did minicomputer vendors. Symons said IBM and Intergraph Corp., Computervision's chief rivals in CAD/CAM, continued to gain market share at the expense of Computervision, even though Intergraph's revenue for the first three months will probably be less than earlier expectations.

Symons said Computervision's 5000 system, based on an IBM host, has not been well received by users and that Computervision "has not added a tremendous amount of value to the IBM mainframe at this point." The system is targeted at MIS executives who already "have a tight relationship with IBM" and see no need to pay Computervision's markup.

Although the company soared to the top of the CAD/CAM industry via sales of its CVS 4000 series, it failed to transport its popular Cadds 4X software to the IBM-based 5000 or to the Sun Microsystems, Inc.-based 3000. Symons said Computervision needs to unbundle its software but that could take 12 to 18 months, during which time the competition would continue to gain market share.

At Honeywell's Small Computer and Office Systems Group, all operations will be closed down during the weeks of April 29 to May 3, May 20-24, Aug. 26-30 and Dec. 23-27. Employees will be asked to take vacation time or unpaid leave or a combination, the company said. The December shutdown includes three paid holidays.

Honeywell said the 120 employees affected by the work force reduction will be notified May 10, and their last day of employment will be June 7.

"We are taking these difficult actions because, like many of our competitors, we have seen a softening in the small computer systems market since the fourth quarter of 1984," said Eugene Manno, group vice-president of SCOS.

Honeywell's SCOS includes operations in Billerica, Mass., and Puerto Rico.

Japan's pledge to open markets draws mixed response in U.S.

WASHINGTON, D.C. — Japanese Prime Minister Yasuhiro Nakasone's pledge last week to open Japan's domestic markets to foreign imports drew mixed responses from U.S. trade associations representing high-technology companies.

Brian Wynne, manager of international trade affairs with the American Electronics Association (AEA), said his organization "is less interested in policy pronouncements than in how things are implemented [by] lower level officials."

Although the AEA found little of anything new in the recent Japanese proposal, Wynne declared, "it is very important that Prime Minister Nakasone articulated the critical nature of the problem in terms of access" to the Japanese markets.

No surprises

Charlotte LeGates, a representative of the Computer and Business Equipment Manufacturers Association (Cbema), agreed there were no surprises in the proposals but added that Nakasone's pledge was very positive. According to LeGates, Nakasone has been "very committed in negotiations with U.S. trade representatives and in his statements [concerning] opening up more markets."

One measure that was included in the Japanese proposal would enable foreign telecommunications companies to participate in establishing standards for telecommunications equipment, a market that U.S. manufacturers believe could absorb billions of dollars of U.S. imports due to the recent deregulation of Japan's Nippon Telegraph and Telephone Corp.

"Now that that ordinance is in place," Wynne said, "we can start talking about market access issues." But, he added, the bottom line for U.S. electronics firms is the end result of the Japanese liberalization efforts and whether those efforts actually do increase imports from non-Japanese manufacturers.

Software copyrighted

The Japanese also said they will consider eliminating tariffs on imported electronics goods and will apply copyright protection to computer software.

Recent calls for U.S. trade retaliation [CW, April 8] seem unlikely to be dampened because the Japanese government has failed to implement specific goals and timetables for erasing entry barriers to imports.

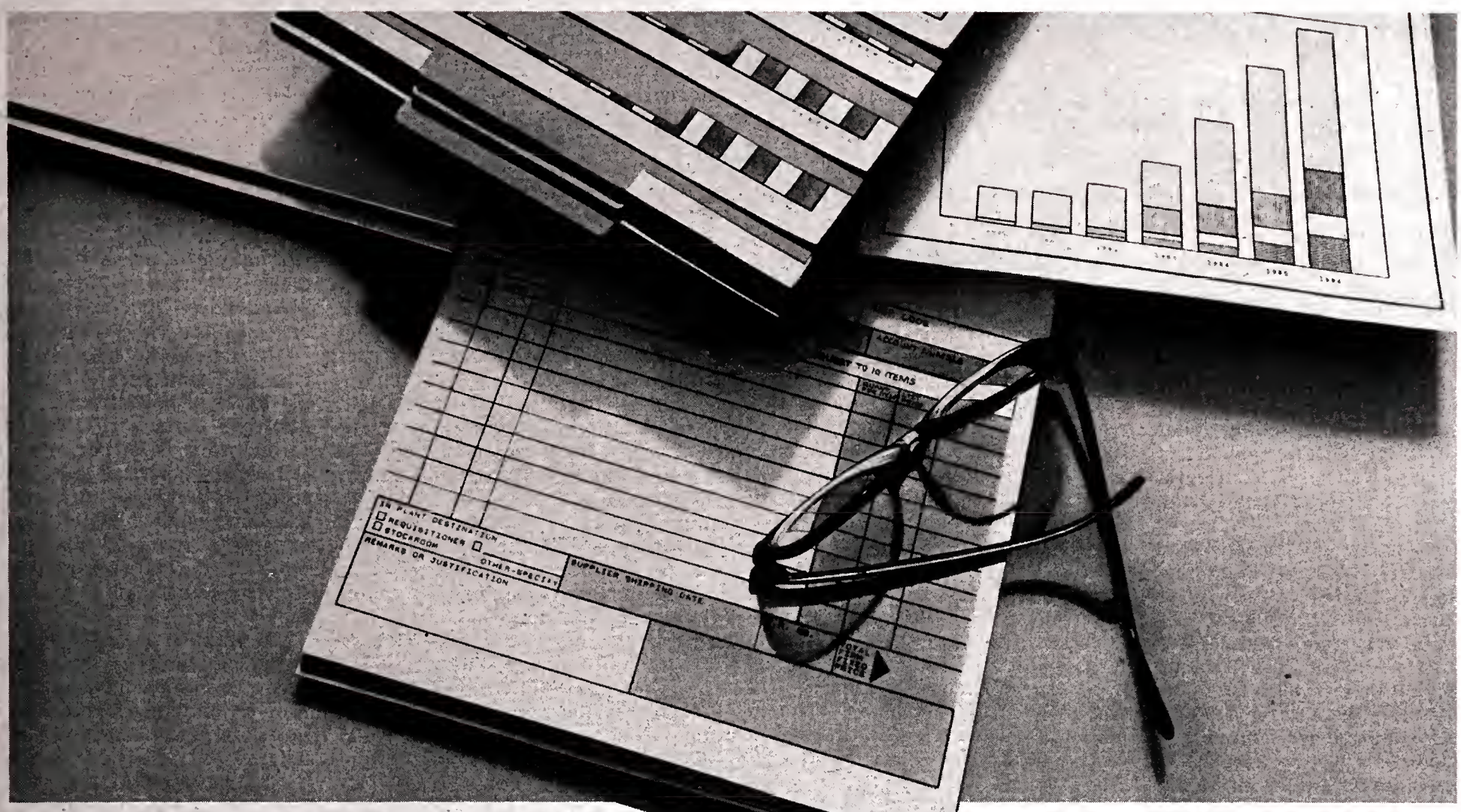
LeGates said Cbema is urging restraint on the part of U.S. industry and is opposed to protectionist measures. Cbema believes that more action is needed by the Japanese, LeGates said, "but clearly you can't change an entrenched system overnight."

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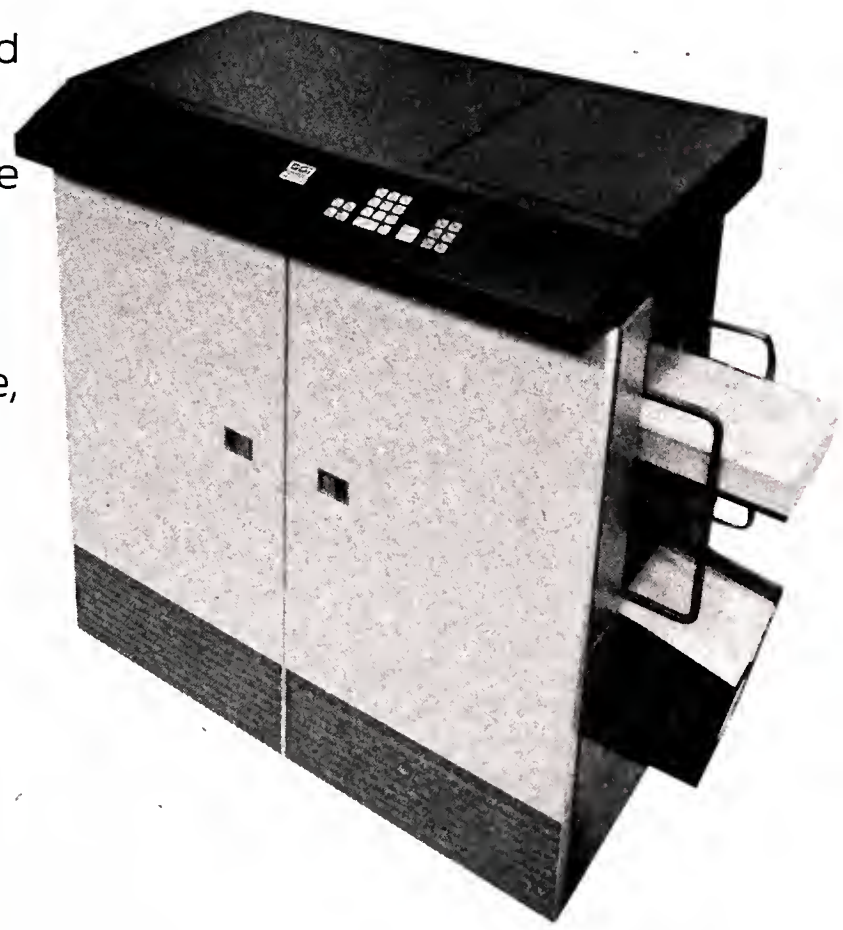

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Sperry unwraps mainframe relational data base system

By Donna Raimondi
CW Staff

BLUE BELL, Pa. — Sperry Corp. has announced a relational data base processor system that integrates a Britton-Lee, Inc. Relational Data Base Processor and MPI disk drives with one or more Sperry 1100 series mainframes running under Sperry's OS11 operating system.

An IBM mainframe running under IBM's VM/CMS operating system can also be linked to an initial configuration consisting of Sperry's newly announced Shared system and a Sperry 1100. The system will be marketed overseas under the name Relational Server RS 1000.

The basic configuration of the Sperry Shared system consists of a Britton-Lee Intelligent Data Machine (IDM) 500/2 processor with 2M bytes of main memory, an 1100 host interface (block multiplexer channel interface board), a system console, a data base administrator's workstation — which is a Sperry Personal Computer equipped with Sperry's SQL software — and two 340M-byte disk drives. This basic system costs $250,000 and includes data base administration software, console software, 1100 Shared Control software and Britton-Lee's IDM internal software for its relational data management system, Sperry said.

The basic system includes everything a user needs to access the data base machine except for the user interface software, the vendor said.

The Shared system is said to store information in up to 50 data bases. It can provide information to one 1100 mainframe, share information with two 1100 systems or share information with one 1100 and one IBM mainframe, the vendor said. The system attaches to 1100 and IBM mainframes through block multiplexer channels.

Sperry and IBM micros can be directly attached to the system through RS-232 ports, the vendor said. The system can deliver information directly to the personal computers without going through a mainframe if the personal computers are equipped with Sperry's Shared PC Support board, which costs $2,000.

Users with Sperry's Mapper system must install the Mapper Shared Interface data extract facility software on their 1100s to access data in the data base system. The system costs $9,000 or may be leased for $200/mo.

Shared IPF SQL software — the Sperry version of IBM's SQL — resides on the 1100 host and is the user's query interface, the vendor said. It costs $6,750. Adding a second 1100 to the configuration, the Shared control software package costs $60,000 and another block multiplexer board costs $17,300. Adding an IBM machine to the configuration requires an SQL software package developed by Britton-Lee and available from Sperry for a one-time license fee of $35,000.

The system's internal memory can be expanded to 6M bytes in 1M-byte increments at $9,000 per megabyte, the vendor said. Up to 15 workstations — Sperry Personal Computers with a minimum of 512K bytes of memory, which range from $3,000 to $6,000 each, depending upon configuration — can be attached via RS-232 interface ports, with one port reserved for a data base administrator that comes with the system.

Mass storage is said to be expandable in two-drive increments at a cost of $26,000 for two disk drives and $56,000 for a four-drive cabinet of up to 4.8G bytes.

More information is available from Sperry, P.O. Box 500, Blue Bell, Pa. 19424.

TANDEM from page 1

ment and can be installed in a typical business office, although users would be well advised to place it off to one side in the manner of photocopiers, according to Tandem officials. "It puts out enough heat and noise that you probably wouldn't want to have it next to your desk," according to Gerald Peterson, vice-president of Tandem's product management.

Both the Nonstop II and the TXP machines require a computer room with air-conditioning and other special amenities and are geared for the central offices of large corporations.

In addition to running independently of a computer room, the EXT differs from its two sister systems in its packaging. In a standard configuration, all the machine's systems hardware — including its 8-in. Winchester disk units — is integrated in one cabinet that occupies 11.8 sq ft of floor space and stands 55.5 in. high.

The combination of the EXT's relatively small footprint and its ability to operate without special environments reportedly makes the processor well suited for users in the field or in district offices of major corporations.

The advent of the distributed processing system will enable Tandem to address a huge user class that would otherwise lie beyond its technological reach, according to Tandem Product Manager Doug Ricketts.

The EXT uses the same Guardian control program, Encompass relational data base management system and Expand networking software as the rest of Tandem's processor family. An EXT system operating in the field can be incorporated in the same teleprocessing network with a TXP or Nonstop II back at headquarters, Peterson said.

In a minimum configuration containing two processors, the EXT executes roughly 1.6 million instructions per second, more than twice the throughput of its nearest IBM equivalent — the base model of the recently introduced Stratus Computer, Inc.-based System/88, Ricketts said.

In addition to two processors, a base EXT configuration incorporates 2M bytes of main memory per CPU, two disk units with 128M bytes of formatted storage per drive and all the requisite system and networking software. All the above modules fit in the same cabinet, which has enough expansion room to hold up to 8M bytes of internal storage per processor, two additional disk units and a tape system.

To upgrade the EXT still further, for a maximum system capacity of four processors, 32M bytes of main memory and eight 128M-byte disk units, users can attach a second cabinet.

Shipments of the EXT, which will be sold both through Tandem's direct sales force and through third parties, will begin immediately.

A minimum two-processor EXT costs $120,000, compared with $180,000 for a similarly configured Nonstop II.

Tandem is headquartered at 19333 Vallco Pkwy., Cupertino, Calif. 95014.

STRATUS from page 1

age — offers fault-tolerant computing by monitoring itself for component failure; switching to the backup, or twin, component; and notifying the user and vendor that a problem exists, the vendor said.

The system also offers fault-tolerant communications through self-checking, twin controllers and redundant buses. The system is said to support a variety of communications protocols, including IBM's Systems Network Architecture and Binary Synchronous Communications, Burroughs Corp.'s Poll/Select and X.25/X.29 and Ascii. It also supports the Society for Worldwide Interbank Financial Telecommunications and Visa networks, Stratus' Stratalink intermodule bus and Stratanet global communications network.

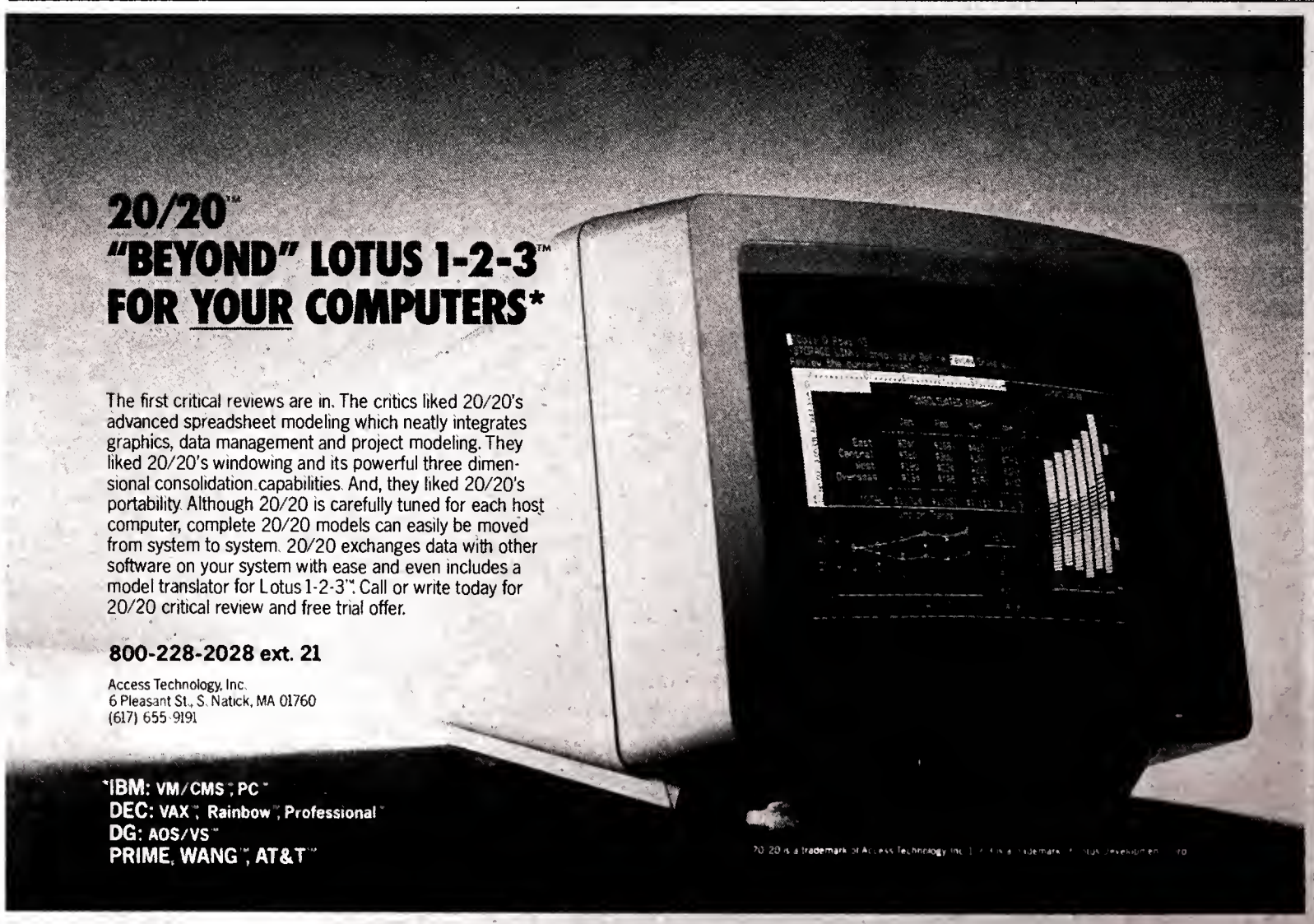
The FT250 includes the Stratus VOS operating system, a transaction processing facility, a forms management system, a text editing package and one of six languages: Cobol, Fortran, Basic, C, Pascal or PL/I. It is software- and application-compatible with every other Stratus system, the vendor said.

Can use Unix-based applications

Users can add Stratus' Unix system facility (USF), which allows the use of AT&T's Unix-based applications on machines running Stratus' VOS operating system, the vendor said. The addition of USF is priced in accordance with AT&T regulations and costs approximately $8,000 for a 16-user system.

The $115,000 4M-byte basic configuration of the FT250 can be expanded to 8M bytes of duplexed memory (or 16M bytes of physical memory) in 2M-byte increments, at $11,000 per 2M-byte board, and 21G bytes of on-line disk storage. Four tape drives and 64 communications ports can also be supported. Upgrades from the FT250 to Stratus' XA400, doubling the power of the system, costs $64,000, the vendor said.

The system is available immediately. More information can be obtained from Stratus at 55 Fairbanks Blvd., Marlboro, Mass. 01752.



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INFODATA®

NEWS

Swamped IRS Tele-Tax service lines keep callers on hold

WASHINGTON, D.C. — Want an exercise in futility? Try calling the Internal Revenue Service to find out when your tax refund will be mailed.

Using the IRS' Tele-Tax service, trumpeted in the instructions for completing tax forms, taxpayers in 46 U.S. cities can do just that for the price of a local call. When they make the call, however, they are likely to get a busy signal.

A television station here recently tried to call as part of a newscast. No go. A *Computerworld* reporter tried a dozen times. Zilch. Even Tele-Tax project leader Bob Hare said he sometimes cannot test the service because of busy signals.

"The [Tele-Tax] program has been so successful that users are tied up," acknowledged IRS spokesman Steve Pyrek.

Tele-Tax, he explained, was computerized this year but has been unable to answer the number of calls pouring in — as many as 200,000 per week — because of the limited number of phone lines connected at each of its 26 regional sites, he said.

The Tele-Tax computer serving the New York metropolitan area, for example, has only 50 lines connected.

Taxpayers who get through encounter a high-tech system that allows them to use their Touch-Tone telephone's keypad to query the Sperry Corp. mainframe at the nearest IRS regional Service Center and find out when their refund will be mailed.

The keypad can also be used to key in the code to call up recorded explanations, in digitized speech, of any of nearly 200 sections of the tax form.

Rotary-dial phone users restricted

Callers with rotary-dial phones, however, are not so fortunate. Though they can receive the same assistance, they must go through a Tele-Tax operator, which means they must call during business hours. Touch-Tone callers, on the other hand, can call at any time.

Also, callers using rotary-dial phones who do get through only to be put on hold are automatically disconnected by a Tele-Tax computer if they wait longer than five minutes.

Tele-Tax is based on a $2.5 million system of Vocom data entry/voice response computers from Perception Technology Corp. of Canton, Mass. The Vocoms are based on a Digital Equipment Corp. LSI-11 minicomputer board, with an attached unit that supports either 25 or 50 telephone lines.

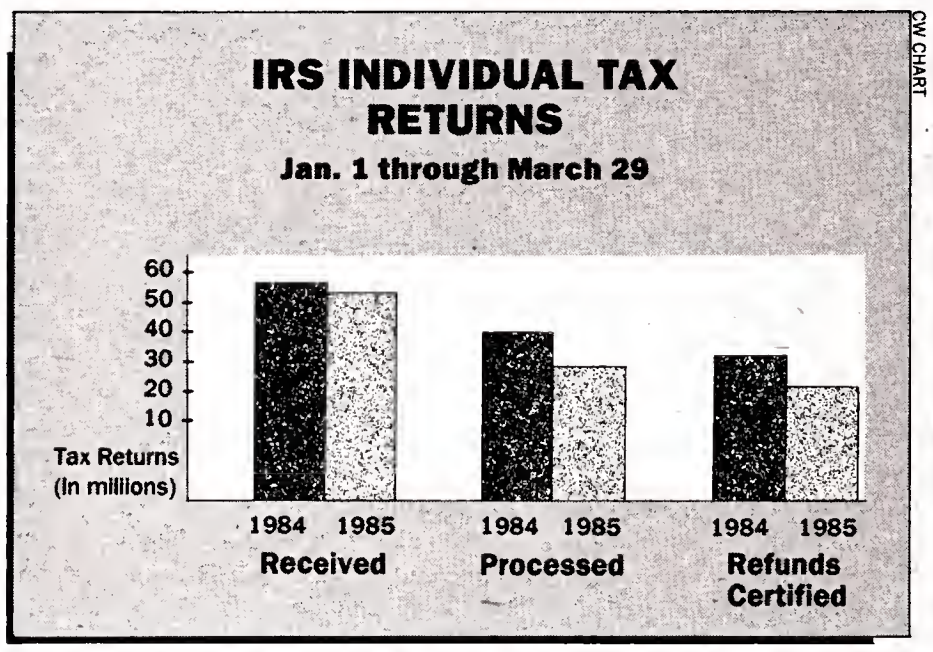
The computers, installed in November, replaced operators who, in the previous three years of Tele-Tax's existence, had answered calls and played tape-recorded explanations of sections of the tax form. The recorded explanations are now digitized and stored on each Vocom's 10M-byte hard disk unit.

The IRS computerized Tele-Tax as a means of reducing the cost of additional operators if the volume of calls kept growing, according to Phil Russo, assistant director of IRS taxpayer service.

Russo said taxpayers who want to find out when to expect their refund check should hold off on calling until ten weeks after filing their tax form. They are most likely to get a busy signal, he cautioned, if they call Tele-Tax around midday, its most busy time. He also advised calling in the later part of the week.

As it is for many taxpayers, Monday is the system's worst day.

— Edward Warner



REFUND from page 1

The delay in processing returns has not been the only problem caused by the Service Center Replacement System (SCRS). At congressional hearings last month, IRS officials said SCRS problems had caused the backlog of unanswered taxpayer correspondence and adjustments to triple and had contributed to other snafus because the changeover distracted computer staff from regular duties [CW, March 18].

Tom Laycock, assistant IRS commissioner for computer services, said the SCRS problems fall into the following three categories:

■ Frequent problems have arisen with the 48 heavily used tape drives, such as creased tapes and tapes that are created on one drive but cannot be read on another.

■ When hardware problems occur, the IRS frequently must redo hours of input work because the operating software's checkpoint/restart feature does not always work. (This feature saves the latest block of input in memory and repositions the tape to begin work again.)

"Instead of having to redo a half-hour of input, we've had to go back sometimes to redo six or 12 hours [of input]," Laycock explained.

■ IRS programmers are working to correct bugs in the applications software. "[Last year] we recognized that those Cobol programs were not running anywhere near as fast as we needed, so we launched an optimization effort that we had never planned on needing. That caused us not to do as much system acceptability testing as we had wanted to do," Laycock explained.

The Philadelphia and Brookhaven, N.Y., centers have experienced the most trouble and consequently are about two weeks behind in processing tax returns, Laycock said.

"It all seems to boil down to the fact that those centers that had hardware problems [also] had restart problems and got behind," he said.

IRS awards Sperry contract

The replacement process began in June 1981 when the IRS awarded a $102.6 million contract to Sperry for new equipment and maintenance — the largest single computer purchase in IRS history.

At the time, the IRS said the hardware change was needed because "the equipment being replaced is up to 16 years old and is no longer manufactured, so it cannot be further upgraded."

Laycock added that it was hard to get spare parts for the old mainframes and virtually impossible to find experienced engineers who would work with the outdated system.

The IRS was ready to make the conversion last November and had to choose between entering the 1985 tax season with old computers unable to handle the load or going ahead with the new system in spite of the impending glitches, officials explained.

"We chose the second option, and, despite the transition problems, we will ultimately increase our capacity and speed dramatically," Egger said recently.

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NEWS

IRS brings up 6000-terminal multiuser Unix system

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — It has taken four years to implement, but an AT&T Unix-based distributed processing system is now being used by a branch of the Internal Revenue Service in its 10 offices.

The project began in 1981 — before distributed processing in a multiuser environment was a popular concept — when IRS planners opted to implement such a system in 10 IRS branch offices.

By 1983, a contract was awarded for the installation of 400 minicomputer systems that would support dumb Ascii terminals and would run under both Digital Research, Inc.'s CP/M and AT&T Unix operating systems software. These specifications were spelled out, to the consternation of vendors, by IRS planners.

A year and a half later, 400 Zilog, Inc. Model 31 systems have been installed, more than 6,000 terminals are hooked up, and Eugene Barbato Jr., chief of the IRS' Consulting Services branch, is a happy man.

Barbato's shop has a healthy library of more than 2,000 AT&T Unix applications programs. Most important of all, the headaches common to incompatible systems installation that the federal government often suffers as a result of contracting laws have been few.

No alternatives to multiuser system

"In 1981, we decided there were no alternatives to a multiuser system, since we knew we could not become locked into one vendor's solution," Barbato commented last week at an AT&T Unix users meeting held at the IRS' main headquarters. "The other vendors' products were dead in the water as far as meeting our requirements. They couldn't because they did not have [an AT&T Unix] capability, and Zilog did."

The Zilog machines are used across the country at district and branch offices of the IRS, where they support administrative jobs such as tracking correspondence and the examinations of delinquent taxpayers, the collection of payments, the resolution of problems, inventory controls such as the tracking of liens placed on delinquent taxpayers' property and word processing.

Barbato's shop serves as a clearinghouse, or a broker testing Unix applications products developed by vendors or at universities.

One AT&T Unix application product, the Multi-Channel Memo Distribution Facility, was developed at the University of Delaware for the U.S. Army and modified to fit the IRS offices. It delivers mail to addresses on the IRS's 400 systems automatically through designated routes lodged in the memory of the system.

To Barbato, one of the main advantages of the Unix environment is the ability to control local processing rather than using a centralized management system. Yet this advantage has led to the major problem now facing the system — the inability to perform micro-to-mainframe processing.

"We can download but can't upload [data]. This capability was not built into our requirements when we ordered the current system, and privacy regulations dictate that we can't access the main data processing centers [where taxpayer returns are processed for errors and delinquencies], much as we would like to," Barbato said. He added that the agency is currently working on uploading processed data from the Zilogs to a stand-alone front-end processor that will check the data for accuracy prior to mainframe entry.

The IRS' AT&T Unix system is currently using a data base management system developed by Informix Corp. in which the requirements for applications development are clear-cut. "We are trying to proscribe the use of C, except on a waiver basis, when writing applications," Barbato said. He justified this move on the grounds that programmers at government salary scales who are proficient in C programming are snapped up by private-sector "Beltway Bandits," firms in the Washington, D.C., area that pay wages four times higher than what the IRS pays. "We would just get lines of code no one could later make sense of," he said.

Experiments order of the day

Other developments at Consulting Services, where experiments are the order of the day, are the variety of terminals hooked up to the Zilogs, such as Apple Computer, Inc.'s Lisa and Macintosh, Texas Instruments, Inc.'s Professional workstation and the IBM Personal Computer. Additionally, Zilogs are being linked in clusters at large district offices, where processing needs are greater, by private branch exchanges acting as data traffic cops.

Barbato spoke wryly of the current fascination in the marketplace with local-area networks. "You may really need a local-area network when your users really need the power of the personal computer; otherwise, what's wrong with distributed processing?"

Despite this demurral, Consulting Services does have a local-area network that is used for applications development. Comparing the mini-terminal emulation approach with the network-micro approach, Barbato said the costs are equal.

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If you want to learn to code effective job-control language for a DOS/VSE system, you've got your work cut out for you. The information you need is spread through more than a dozen IBM manuals. And because the manuals have to cover everything, the important points are often hidden by the details.

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NEWS

Figures show equal access eroding AT&T market share

By John Dix
CW Staff

Preliminary figures have indicated that competitors are taking business from AT&T in the scramble to capture customers in areas upgraded for equal access, but fewer than half of the customers in these areas are choosing carriers.

Under terms specified in the divestiture of AT&T, the former Bell operating companies have to upgrade their systems to provide all long-distance carriers with the same kind of access to their local facilities that AT&T has always enjoyed. Upgraded access enables carriers like MCI Communications Corp., GTE Sprint Communications Corp. and Western Union Corp. to provide service access by dialing a single digit, service use from rotary telephones and more accurate billing.

As the divested Bell companies upgrade for equal access, users are being asked to choose a primary long-distance carrier. This carrier will be accessed in the same manner that AT&T is today, by dialing "1." Other carriers can be used — providing the customer has a business relationship with each company — by dialing "10" and then a three-digit carrier code used to distinguish the carrier.

Conversion to equal access started nine months ago in Charleston, W. Va., and is scheduled to be completed by Sept. 1, 1986 [CW, May 28]. The former Bell companies will only upgrade metropolitan areas with 10,000 lines or more. This means roughly 52 million to 56 million customers — roughly 65% to 70% of all Bell lines installed — should have equal access, an MCI spokesman estimated.

Equal access availability unknown

By the end of 1984 equal access was available in 5% of the country, serving more than two million people, the long-distance carriers generally agree. But none of the carriers know for certain the number of customers today that have equal access available to them. An AT&T spokesman estimated that figure to be 15 million people.

The former Bell companies notify customers 90 days before equal access is cut over in a given area. Customers who do not presubscribe before that date still have 180 days to pick a carrier. After that period, choosing a carrier costs $5.

Of the 15 million customers who now have the equal-access option, only 46% have chosen a primary long-distance carrier, according to a study by Market Viewpoint, Inc., an Armonk, N.Y., research firm commissioned by AT&T.

Department of Justice figures back up that study's findings. In a survey of the divested Bell operating companies, the department found that, depending on area, only 5% to 24% of customers presubscribed to long-distance carriers.

"Although additional consumers made affirmitive choices after their end offices were switched to equal access," the report said, "in no case did 50% make an affirmative choice."

> ”
>
> *Judging by some preliminary numbers, AT&T appears to be losing market share to its competitors.*

While it is still too early to guess the outcome of this high-stakes scrum, judging by some preliminary numbers, AT&T appears to be losing market share to its competitors.

According to AT&T's study, an estimated seven million of the possible 15 million people in equal-access areas have actually signed with long-haul carriers. Of this seven million, 80% have signed with the nation's three largest carriers, according to carrier claims and *Computerworld* calculations:

- AT&T has signed 65%, or four and a half million equal-access users, a company spokesman estimated.
- MCI, AT&T's largest competitor, may have 13%, or 900,000 new equal-access customers. This number was calculated by applying MCI's 1984 10% capture rate against the total number of customers who now have equal access and adding it to the 200,000 customers MCI signed in 1984.
- GTE Sprint reports that it has 160,000 new equal-access customers, which is about 2% of the equal-access user base.

The remaining 20%, roughly 1½ million equal-access customers, have presumably signed with other long-distance carriers.

While these figures would indicate that MCI, going head-to-head with AT&T in competition for those seven million customers, captured 20% as many users as AT&T, they do not tell the whole story.

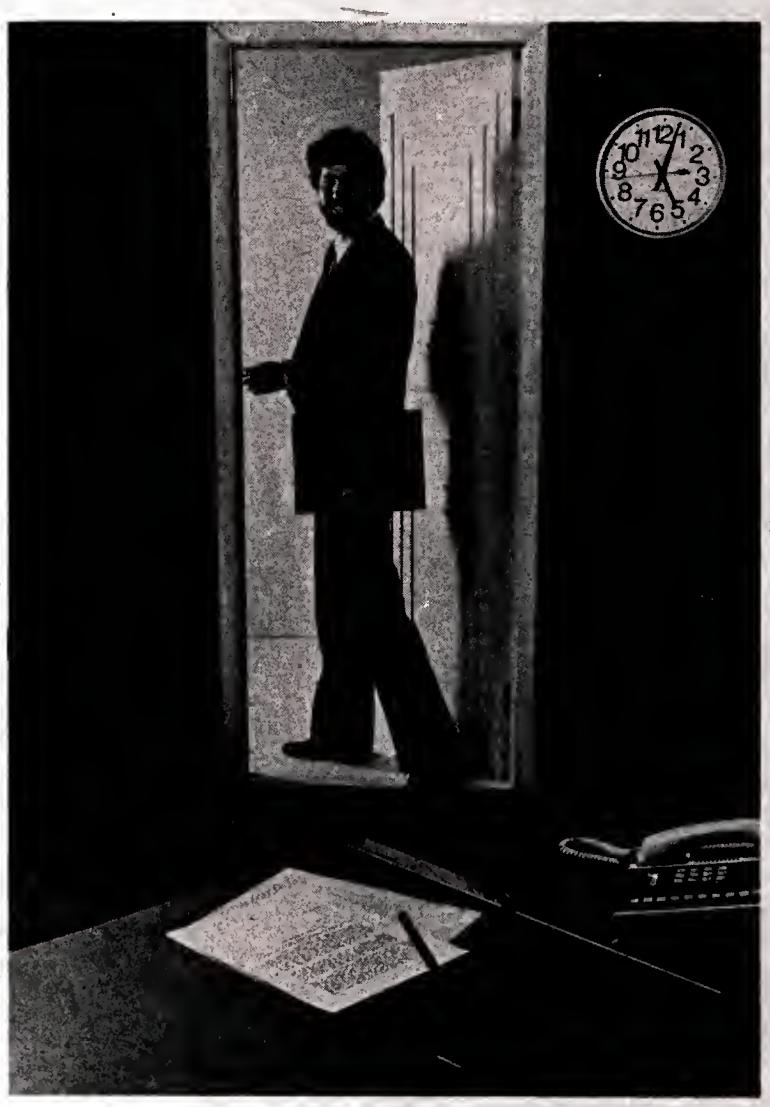
What will become of the other eight million customers that have not chosen a carrier? Under the system predominantly used today, if these customers do not pick a carrier they will, by default, become AT&T customers.

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BYPASS from page 1

By establishing a private link to MCI's access point in Boston, Prime completely bypassed New England Telephone Co., which would normally provide the connecting circuits to the long-haul carrier. Hawkins estimated that the MCI link will pay for itself in 3½ years.

This direct-connect option was a key consideration that led Prime, in its search for a more cost-effective long-distance solution, to cut its use of AT&T's Wats service in favor of MCI, he said. At the time, AT&T did not offer the direct-connect option. Today, MCI carries 70% of Prime's long-distance traffic; the balance of Prime's needs are met by Wats.

Prime uses a 2-GHz digital microwave radio system, made by Avantek Corp., to connect its headquarters here to MCI's access point on top of Boston's Prudential Center, 16 miles away. Through a package lease, Prime has a cubicle-size, environmentally controlled room in the Prudential building, two floors above MCI's facilities, and rights to roof space for microwave antennae.

> *The MCI microwave link will pay for itself in three and a half years, Prime estimated.*

The Avantek radio can support 16 1.54M bit/sec. T1 links, but currently Prime uses only three T1s. Each of these are multiplexed down into 24 voice channels, using Northern Telecom, Inc. SL-1 remote peripheral equipment. This fulfills Prime's present need for 58 voice channels to MCI and provides the capacity to expand the system to 384 64K bit/sec. voice channels.

Hawkins said the remote peripheral equipment was used because Prime already owned it and because it "gives us some maintenance diagnostics that some of the other multiplexing techniques do not." He admitted, however, that the remote peripheral equipment, which he described as similar to a private branch exchange, is not as bandwidth efficient as some other T1 multiplexers.


Hawkins

Approximately 60% of the traffic multiplexed over the link to MCI runs to and from a Northern Telecom SL-1 PBX in Prime's headquarters. The rest of the traffic is routed to other facilities over Prime's local 12-GHz microwave bypass system.

Although the remote peripheral equipment system breaks the T1 capacity down to the single-circuit level, Hawkins said Prime is studying the possibility of using a Northern Telecom Digital Trunk Interface that would enable T1 links to be interfaced directly with the SL-1.

Asked if there was an appreciable difference between the sound quality of MCI's services and AT&T's, Hawkins said Prime has noticed minor differences in the quality but they are "not sufficient enough for us to bear the burden of the higher charges."

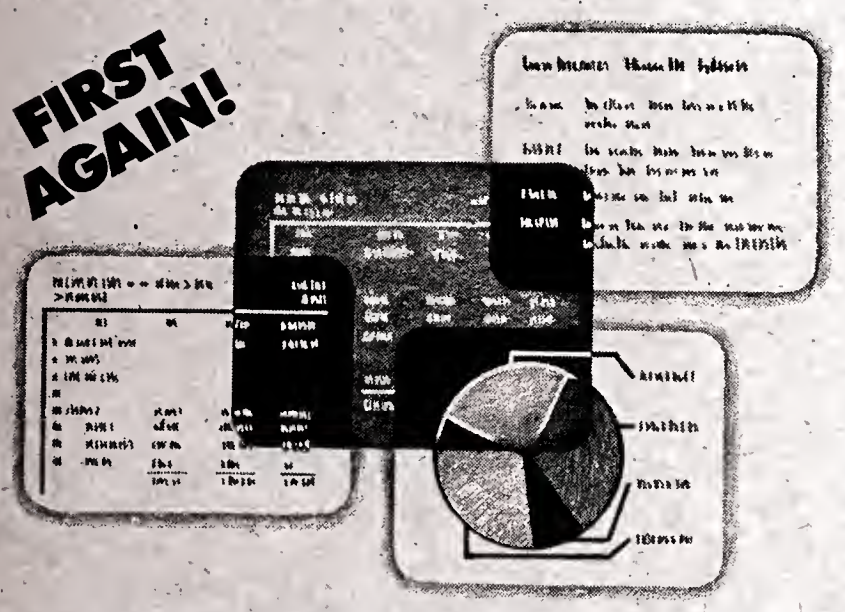
C-85 conference slated for May

SAN FRANCISCO — The first international conference devoted to the C programming language, C-85, is scheduled for May 13-15 at the Ramada Renaissance Hotel here.

The conference is intended to be a noncommercial forum for software developers, programmers and others concerned with the future of the C language. The conference will include a day-long session on the Ansi X3J11 standard and workshops on writing graphics, business and database applications in C.

The conference sponsors are Lifeboat Associates, PC World Communications, Inc., Microsoft Corp. and the *C Journal*. The registration fee for the conference is $190.

More information is available from Lifeboat Associates, 1651 Third Ave., New York, N.Y. 10038.



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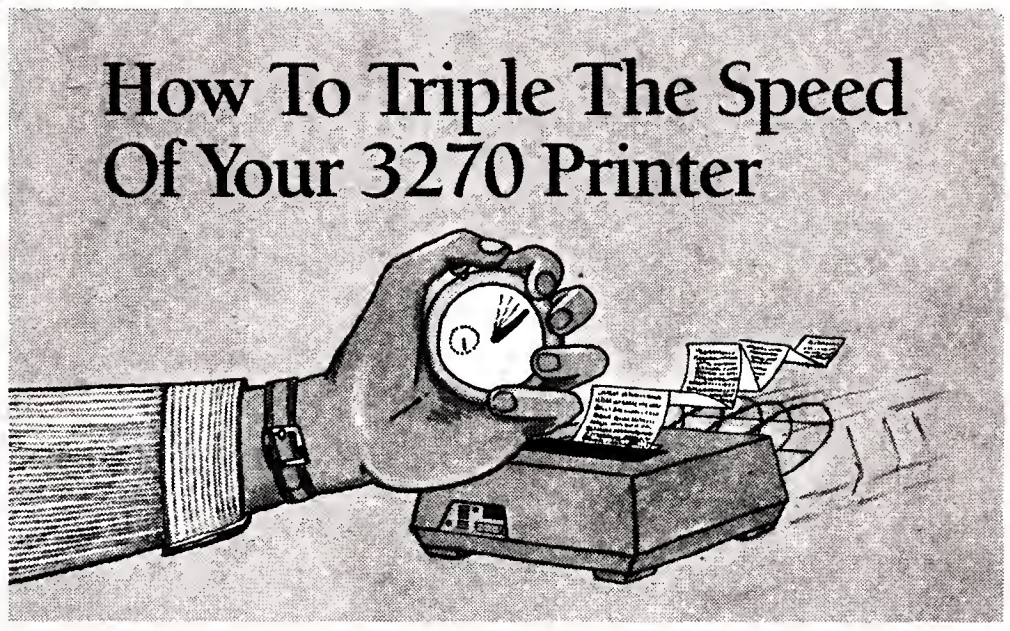
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ICMS adds little to existing abilities, Cullinet users say

By Maura McEnaney
CW Staff

Cullinet Software, Inc.'s recent introduction of software for the corporate information center appears to be little more than window dressing for existing products, users of other Cullinet products told *Computerworld*.

Announced last month, the Information Center Management System (ICMS) is based on Cullinet's Information Data Base (IDB) [CW, April 1]. ICMS is sold as a stand-alone product and incorporates Cullinet's query and reporting tools, links to minicomputer environments and microcomputer software packages.

At the time of the product announcement, Cullinet executives said ICMS provides mainframe access to all levels of computer users. The strength of ICMS, according to ICMS product manager Jack Armstrong, is that for the first time "it characterizes software as a management solution." The product repackaging is aimed at "the rest of the IBM community to whom the concept of providing an information center management system is different," Armstrong said.

But Cullinet users interviewed by *Computerworld* are not jumping to buy ICMS because they believe many of its tools are available in the products they are already using.

"ICMS is an overall name for the package of the Cullinet products without the Cullinet data base," said Rudy Lobou, assistant director of MIS at the City University of New York (Cuny). "ICMS is for people who don't have IDMS, [Cullinet's Integrated Data Base Management System]."

Cuny uses an array of Cullinet's software products, including the latest release of IDMS/R, ADS/Online and Online/English. The school purchased IDB, but has not installed it yet, Lobou said.

According to Lobou, the most interesting portion of the Cullinet announcement is the introduction of software links that will tie ICMS with Cullinet's Goldengate and Lotus Development Corp.'s 1-2-3 and Symphony microcomputer software, giving users mainframe data access within the IDB environment. Universal Link and Symphony Link will be available in the fourth quarter.

The university is not yet downloading mainframe data to personal computers. However, Lobou said he expects end users to start calling for mainframe access once applications now being developed are put onto the school's computer system.

Mike Intille, vice-president for information services at Central & South West Services Corp., a utility holding company in Dallas, said ICMS "sounds redundant. . . . It does the same thing I can do with IDB and Goldengate now."

Like Cuny, Central & South West Services uses a full array of Cullinet tools, including IDMS, IDB Goldengate and ADS/Online. Current 1-2-3 users are using products other than Cullinet's to get access to mainframe data, Intille said.

At Comerica, Inc., a bank holding company, Cullinet's announcement was met with some skepticism stemming from past problems with Goldengate micro software. According to John Hundiak, Comerica's manager of systems technology, Goldengate has poor response time, and users have to go through several screens when trying to perform relatively simple functions.

Comerica planned to use Goldengate for the creation of departmental budgets, but problems with the product forced the company to revert to using 1-2-3, isolating departmental budgets on individual disks. Thus, it was the software links to 1-2-3 that piqued Hundiak's interest. "When it comes down to budget time, there's a lot of disk trading that goes on."

Although not interested in the entire ICMS system, Hundiak said, "We're trying to pick the pieces [of software] that apply to us."

Business user expo slated

ANAHEIM, Calif. — The first 1985 Information Management Exposition & Conference for business system end users of Fortune 1,000 corporations will be held June 12-14 at the Anaheim Convention Center.

Info conferences have also been scheduled in New York at the New York Coliseum Oct. 14-17 and in Dallas at Infomart Jan. 7-9, 1986.

The conference reportedly focuses on the latest management and technology issues of concern to business end users. Topics to be covered include communications management, information management, personal computers, office automation, hardware and software technology.

The keynote speaker at the Anaheim conference will be Stephen T. McClellan, author of *The Coming Computer Industry Shakeout*.

The cost of each of the three conferences is $10 for preregistrants or $20 for on-site registrants.

More information is available from Cahners Exposition Group, P.O. Box 3833, 999 Summer St., Stamford, Conn. 06905.

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Why key DP/MIS managers are keeping RCA Cylix a secret.



Early users give thumbs-up to TI's expert systems tool

By Eric Bender
CW Staff

Texas Instruments, Inc.'s Personal Consultant is a good software kit for creating small knowledge-based systems on microcomputers and educating developers about expert systems, beta site users reported.

At a Westinghouse Electric Corp. research and development facility in Pittsburgh, advisory scientist Neil Pessall and senior engineer Jan Schreurs have employed Personal Consultant to develop prototype systems for material sciences investigations.

Although unfamiliar with the software and the TI Professional Computer at the start, Pessall said he and Schreurs in one week "developed three small demonstration programs to show to management." One of these, designed to select materials for nuclear steam generators and including more than 100 production rules, will be expanded, he said.

Another small, knowledge-based system developed with Personal Consultant assists first-time computer purchasers at Infomart, a Dallas market center for computer and information systems. Customers go through a 15-minute session and receive a three- to five-page report suggesting how they should proceed, said Tom Jones, Infomart's marketing vice-president.

The Infomart system, a turnkey job from Boeing Computer Services Co.'s Education and Training Division in Seattle, currently works with 147 production rules, according to Boeing computer instructor Chet Rindfuss. He described Personal Consultant as an excellent tool "that saved us a lot of time."

At Boeing Commercial Airplane Co., a weights risk-assessment system first developed with a version of Teknowledge, Inc.'s S.1 software on a Xerox Corp. Dolphin system is being fine-tuned with Personal Consultant on a TI Professional Computer, according to Boeing software engineer Sheldon Whitman.

The greatest problem during the migration "was not with the software but with the documentation," he said. He anticipates that the software, with 268 rules, will evolve into a production system.

All the users gave the $3,000 Personal Consultant package a thumbs-up for overall design and ease of use. "The system itself, from the standpoint of a developer, is fairly straightforward and clean," Rindfuss said. "There were a few areas where we had to get our fingers dirty doing Lisp code."

End-user interface

Aiming at potential Infomart clients who are unfamiliar with computers, Rindfuss found the program's end-user interface "not as clean as we would want it to be." However, he added, "If you used it on a regular basis or took a day to learn the program, you'd have no problem."

Schreurs described both developer and end-user interfaces as "marvelous" and stressed the ease of developing graphics that help users understand what the expert system is examining.

Personal Consultant is also appropriate for developers who are unfamiliar with expert systems, Whitman said. "You can start building knowledge bases, since you already have an inference engine," Schreurs said.

The software handles systems with up to 400 production rules, according to TI.

However, Pessall noted that his own work in evaluating materials covers "a very large field, and there's no way you can put a significant program on [Professional Computers]." Here, instead, the micro's value "is in letting the customer understand what it is when you talk about expert systems," he said. "It's important to have something you can see."

Based on Integral Quality, Inc.'s interpretive IQ Lisp language, Personal Consultant sometimes runs slowly, Rindfuss said. "When IQ Lisp goes into garbage collection, the program can go into sudden and unpredictable delays" that alarm unsophisticated users, he pointed out.

Terry McMullen, TI artificial intelligence applications marketing manager, said compiled versions and an upgraded text editor will be available this year. The vendor is also moving toward a Common Lisp standard on Personal Consultant, and users eventually will be able to move programs from the Professional Computer to the Explorer, or vice versa, without recoding, he said.

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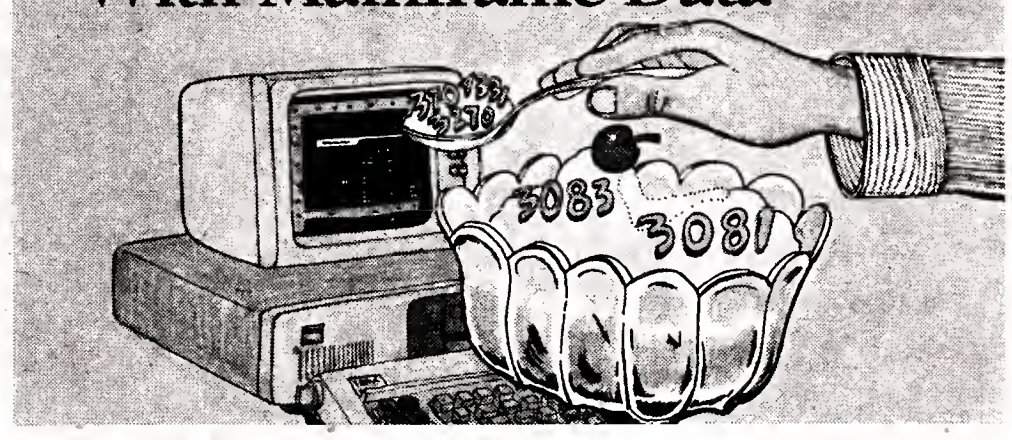
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NEWS

'This is only a test: Your local data center is on fire'

By Jeffry Beeler
CW West Coast Bureau

LOS ANGELES — For Fred Wahlstrom, the trouble began with a telephone call that roused him out of bed at 2:30 in the morning.

At the other end of the line was Wahlstrom's coworker, Emilio Estany, disaster recovery administrator for ARA Services, Inc.'s magazine and book publishing division.

Estany's call brought ill tidings: A few hours earlier, a fire had broken out in the air-conditioning unit of ARA's local data center and had reduced most of the company's hardware to cinders. Estany directed Wahlstrom, an ARA telecommunications programmer, to stand by and await further instructions.

Sometime after 4 a.m., a second phone call from Estany again forced Wahlstrom out of bed. This time, however, the telecommunications programmer was ordered to go to the conference room of a local hotel, where ARA's suddenly homeless MIS department was establishing a temporary command center.

Thus began a frantic effort to replicate ARA's data center at an alternate site and to resume the firm's processing operations as quickly as possible. As the day progressed, nearly every facet of the company's disaster recovery plan was tested under fire. By 7 p.m., 13½ hours after the temporary command center officially went into operation, ARA's systems department had activated a backup data center and was back in business.

Leslie Feasey, the firm's vice-president of management services, voiced satisfaction with ARA's speedy return to MIS production. Feasey said he felt gratified for a second reason: The day-long exercise had been nothing more than a drill, and the destruction of his company's data center was wholly make-believe.

Many corporations have drafted detailed plans for restoring their processing resources in the event of an emergency. On a modest scale, many firms have also taken steps to test their plans' effectiveness, Estany said. But only a handful of user organizations have rigorously tested their recovery procedures under conditions that reasonably approximate a genuine emergency, according to Jack Chapman, a manager with Comdisco Disaster Recovery Services, Inc.

Of Comdisco's roughly 2,000 clients, only five have simulated a data center shutdown and then conducted an impromptu drill to test their ability to activate a backup processing site, Chapman said.

Included among those five atypical customers, he added, is ARA's Southern California office, whose dual IBM 4341 Group I machines supply computing services for the company's 18 operating units throughout the U.S.

ARA's intent in staging a mock disaster and conducting a full-scale drill was to find out whether its recovery procedures work as well in practice as they do in theory.

To satisfy themselves that their plan could withstand even the most dire of emergencies, ARA officials deliberately made the circumstances of their drill as challenging as possible. "We chose to conduct our test on a Thursday night because that's when we have our heaviest production and when we're most likely to lose our data," Estany said.

"We wanted to test the ability of our people to determine what data had been lost, and we wanted an idea of how long it would take us to catch up before we could resume production," he said.

No contact with data center

To add a further touch of realism to its exercise, ARA strictly forbade any of the drill participants from making contact with the company's data center, which all the while continued to operate as usual. "We had to make do with what we had at the time because that's exactly what would happen if we had a real disaster," Estany said.

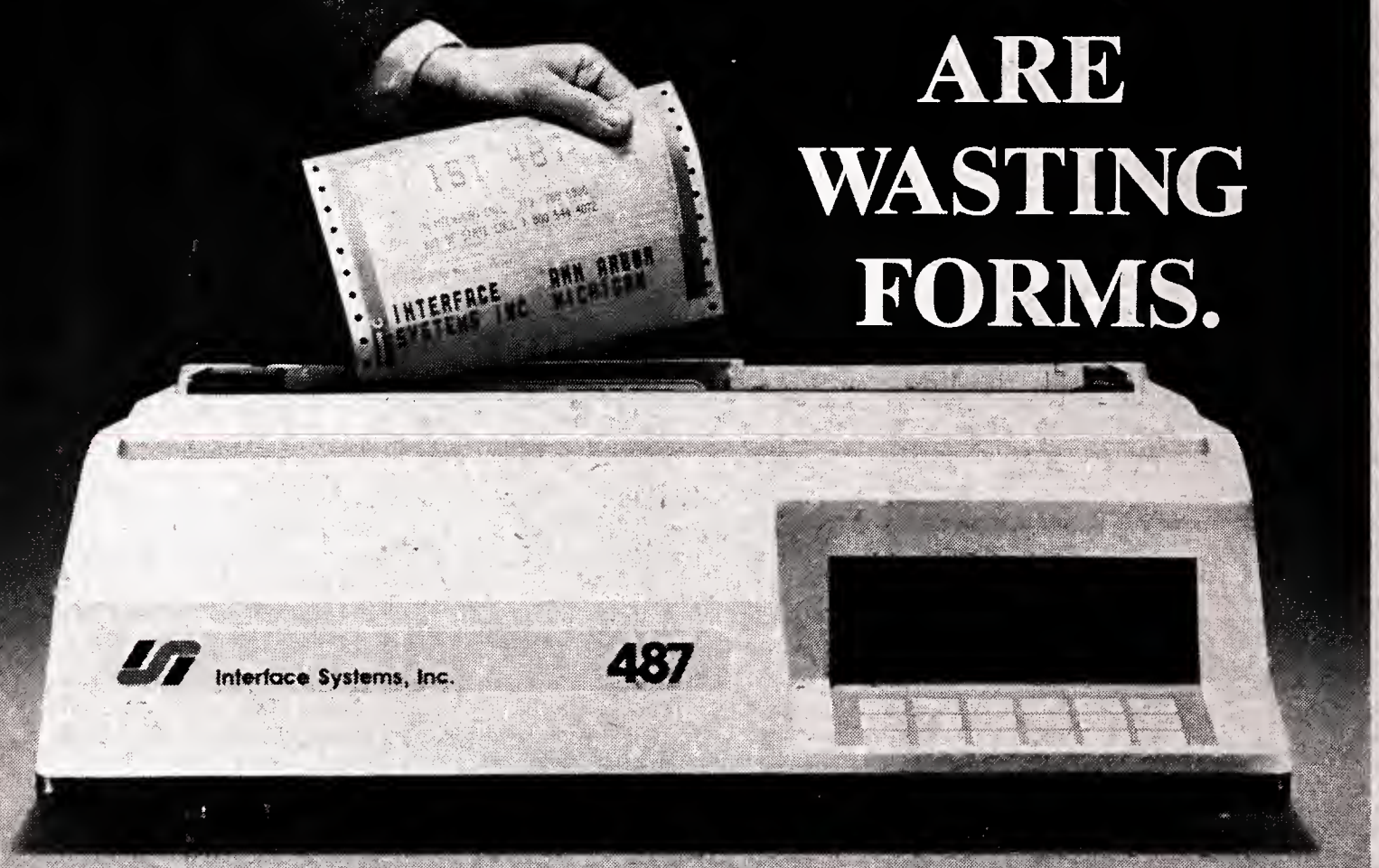
Except for a few minor hitches, ARA's test of its disaster recovery procedures went just about according to plans, Feasey said. After the company secured its temporary command center at approximately 5:30 a.m., Feasey dispatched a group of employees to ARA's backup processing center, which is maintained by Comdisco in Lodi, Calif.

Traveling by commercial airliner, the employees were assigned the task of preparing Comdisco's IBM 3033 Model U to assume the duties of ARA's "destroyed" 4341s. Included in the group was Wahlstrom, whose assignment was to establish the necessary communications links between ARA's 18 operating units and the 3033 Model U's front-end processor, an IBM Series/1.

At the same time, Feasey also dispatched a second group of MIS specialists to ARA's off-site data storage facility in nearby Burbank, Calif. At Arcus Off-Site Storage Corp., the team members retrieved a set of magnetic tapes containing a duplicate copy of their company's key business data, which ARA routinely backs up and stores remotely every day.

By early afternoon, the employees had begun transporting the tapes from Arcus to Comdisco, where they were loaded into the 3033 Model U.

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Arizona city takes top-down approach to OA installation

By Edward Warner
CW Staff

SCOTTSDALE, Ariz. — It should only be expected that an original implemention of office automation should come from this Phoenix suburb's municipal government. After all, Scottsdale pioneered the use of garbage trucks operated by one person and a fire department that is privately owned.

Today, Scottsdale city government is using its penchant for innovation to lend a twist to the ongoing implementation of its new OA system.

Although in most OA implementations, computer terminals are given first to secretaries and clerks and only later put on the desks of the bosses, the city of Scottsdale gave the terminals first to managers. The implementation has worked so well that others have taken notice; early this year the city's OA system received a gold medal award from an industry publication for supporting the best OA implementation.

Scottsdale's OA system, dubbed Comstar, got under way in August with the installation of 150 Sperry Corp. terminals, half of them on the desks of managers. The second phase of the implementation took place in February when the city council and the mayor installed terminals in their homes.

The top-down implementation was spawned, according to Management Systems Director Terry Peterson, by the city government's organizational culture, which he said values sensitivity to employee needs and emphasizes originality.

Understanding the technology

Such a strategy was critical to Comstar's acceptance, elaborated Deputy City Manager Dick Bowers, because administrators have a better understanding of computer technology, and "when we see a problem we don't tend to blame the system."

Had Comstar terminals first been given to secretaries and clerks, Bowers continued, those workers could have been infuriated by the fits and starts that marked Comstar's birth and might have avoided using it.

Comstar, based on a Sperry Corp. 1172 dual-processor mainframe with three Sperry 8480 disk storage systems, is the city's first OA system. Nearly all of the 150 terminals have twin diskette drives and 256K bytes of random-access memory. Implementation is still in progress, Peterson said, and by year's end, as many as 400 terminals could be in use.

At that point, he added, nearly all of the city's 260 administrators will have terminals in their offices.

Peterson said users can switch to Sperry's Mapper data base management system, which the city will use for its records management. One of Mapper's uses will be to track false alarms phoned into the police and fire departments.

An additional benefit of the city's top-down implementation, Peterson added, is that it put computing power in the hands of those who could initially best use it. Although OA may be "a good tool for clericals, it's a super management tool," Peterson said. Comstar's calendaring and E-mail features were the most useful ones for administrators, he said.

"The biggest single thing it does is improve communication, giving managers access to timely information," Peterson added.

No assessment of Comstar's impact on the city has yet been made, but Peterson claimed that a $2 million annual reduction in paper use will accrue by the end of 1986.

Bowers, meanwhile, said Comstar was likely to join the ranks of what he called the city's other trend-setting innovations: one-person garbage trucks and privately run fire departments. The city, he said, takes risks on new ways of doing things "because we choose to think that way. It's fairly entrepreneurial here."

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NEWS

Custom system takes marathon timing task in stride

By Clinton Wilder
CW Staff

BOSTON — Tom Cusson will be in his 11th straight Boston Marathon today, but you won't find his name on the sports page.

Cusson is the designer and supervisor of the Honeywell, Inc. computer system that logs and prints out the finishing times of the 5,540 official entrants who will make the 26-mile, 385-yard trek from Hopkinton, Mass., to downtown Boston starting at noon today. Cusson will be monitoring Honeywell's marathon computer center in a 40-ft van at the finish line, and he could not imagine being anywhere else.

"It's a paid holiday [Patriots' Day in Massachusetts], but I don't think I'd know what to do with myself otherwise," said Cusson, manager of technical support for Honeywell's small computer and office systems division. "It was more of a challenge in the beginning than it is now, but that's because we've conquered it."

With a few upgrades over the years, Cusson's system essentially works the same way it did when Honeywell first offered its computer technology to the Boston Athletic Association (BAA), the sponsor of the marathon, in 1975.

Cusson wrote the Cobol and Assembly language "marathon software" to run on an on-site Honeywell DPS/6 minicomputer, supported by four Honeywell 4300 terminals, 768K bytes of main memory and two 67M-byte hard disks, one of which is used solely for backup. Completing the configuration are three bar-code readers that read codes off the runners' number bibs and a 90 line/min printer for the final results.

The computer's central task is to merge three data bases: the list of runners' names in finishing order from the bar-code readers; the list of finishing times, entered on a push-button cyclic timer device plugged into a terminal keyboard port; and a data base containing select times.

The select times data base comes into play when a crowded pack of marathoners approaches the finish, which means 10 or more runners per second crossing the line. Since it is physically impossible for the timer operator to push the entry button 10 times per second, this is where the computer takes over.

Instead of vainly trying to click the timer every time a runner finishes, the timer operator selects specific runners crossing the line alone, at 10- or 15-sec. intervals, and records their times. An algorithm developed by Cusson then processes the runners who finished in a pack and assigns them finishing times between those of the timer's select runners, who finished just before and just after the pack. It may not be accurate down to the millisecond, but it is much more accurate than any manual system could be, Cusson said.

'Fudging a bit'

"We call that algorithm the fudge, because when it synchronizes 40 runners with, say, 37 finishing times, it's fudging it a bit," Cusson said. "But I would say we're never more than a second off."

The computer's final job is to coordinate the entrant's number and finishing time with information in the data base, entered about a month before the race, listing each entrants' name, address, age, sex, running club affiliation and qualifying time. When that is completed, the official results are printed and delivered to the marathon press room — in 20 minutes for the top finishers, and usually within one hour for the "pack."

The most intricate part of the programming, Cusson said, is the backup system. So far, it has never been used.

"We only have three or four programs running the day of the race, but we have five times that many in case anything goes wrong," Cusson said. "Our error recovery software is far more expensive than what we run."

Expo theme: micro-mainframe links

WASHINGTON, D.C. — "Integrating Micro/Mainframe Technologies" is the theme at the Government Computer Expo scheduled for June 10-13 at the Sheraton Washington Hotel here.

The conference is designed to furnish government managers, DP professionals and end users with information concerning microcomputer-to-mainframe connections.

A number of seminars on topics such as communications concerns, software products and integrating data are scheduled.

The conference is sponsored by the Federation of Government Information Processing Councils and the Information Resources Administration Councils.

There is no charge for attending the expo.

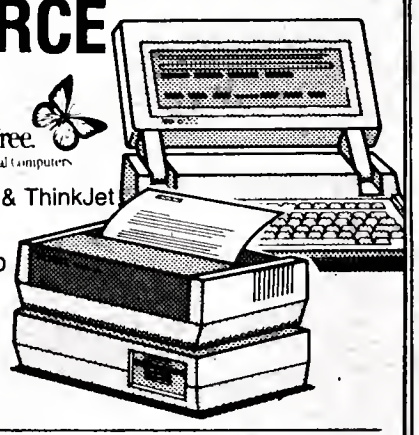
Conference information is available from Government Computer Expo, 1620 Elton Road, Silver Springs, Md. 20903.

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DMV computer error puts innocent motorist in jail

By Kathleen Burton
CW West Coast Bureau

ANCHORAGE, Alaska — A motorist here was mistakenly ordered to spend a night in jail last month because of an improperly programmed computer system that was supposed to reward safe drivers for violation-free driving.

An IBM 3081 computer located at the state government's computer data center here narrowly missed suspending 400 driver's licenses after it began tallying noncurrent traffic violations and demerits and adding them to current data, said Jay Dulany, chief of driver improvement at Alaska's Department of Motor Vehicles (DMV). Agency staff intercepted the notices before they could be mailed out, he added.

> *Due to a miscommunication . . . the system looked back too far, recording violations that should have been erased years ago.*

As a result of the error, an Anchorage resident, C. R. Griffin, spent one night in a Fairbanks, Alaska, jail last March. Griffin was arrested by Fairbanks police following a minor traffic violation after a computer search of the newly programmed Alaska Public Safety Information Network (Aspin) system indicated he was driving with a suspended license. Following his night in jail, Griffin was released and the charges against him were dropped, Dulany said.

The Aspin data base stores statewide records, including current criminal and driving records, on all Alaskans over a five-year period, he explained. Aspin is used by Alaska's police departments, court agencies and state trooper offices. It is accessed via IBM 3270 terminals connected to an IBM 3081 mainframe located in the state's data center. The 3081 operates within IBM's Systems Network Architecture and uses the Adabas/Natural fourth-generation language from Software AG of North America, Inc.

The mishap occurred when the state began transferring driver information into the Aspin system last year.

According to Dulany, the computer was reprogrammed in December to look at past records and ensure that drivers were not escaping penalties and to record credit points for violation-free drivers within the last five years. Both functions were previously handled by several computers, he noted.

System looked too far

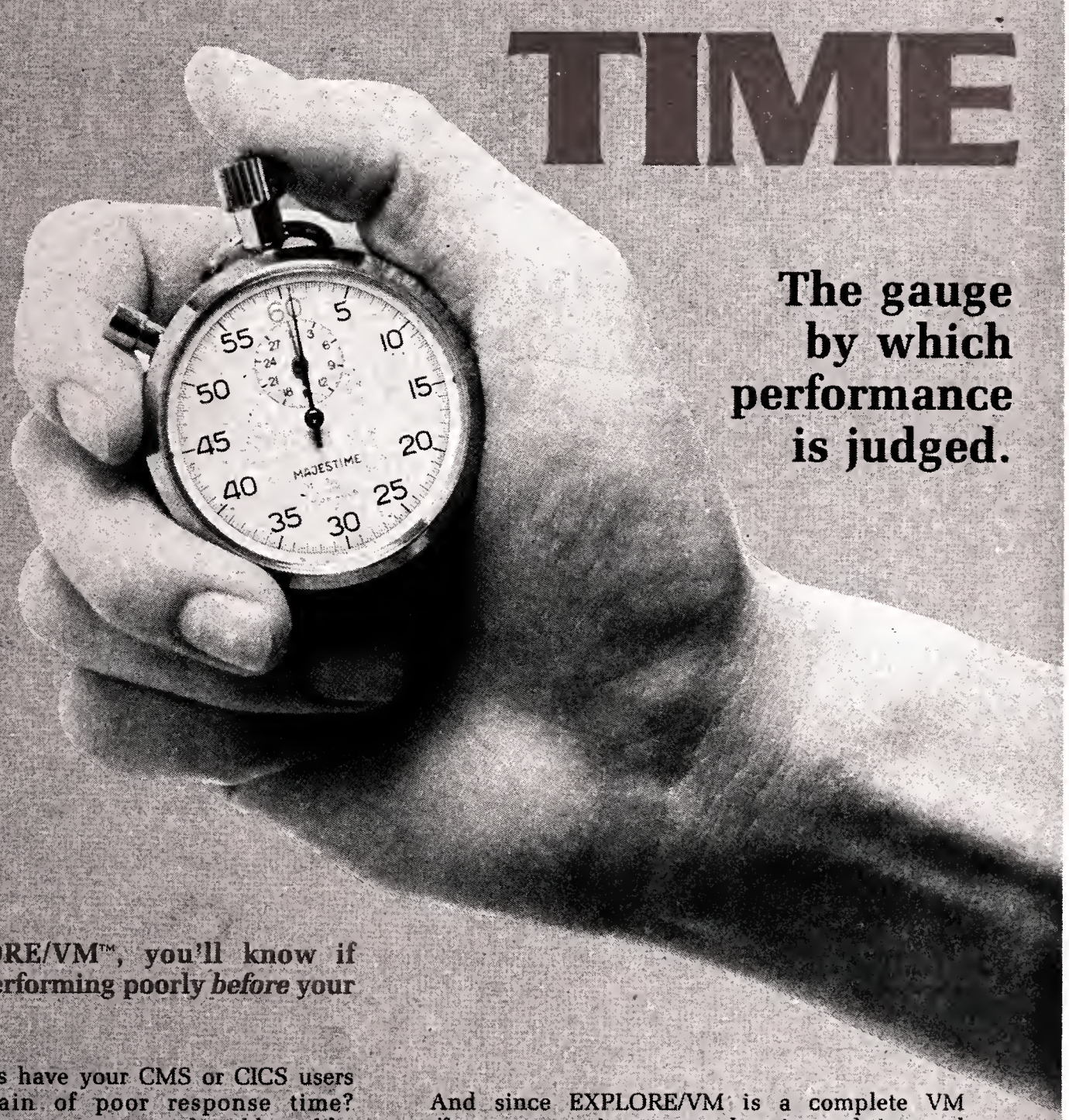
Due to a miscommunication between the DMV and the state's data center, however, the system looked back too far, recording violations that should have been erased from the system years ago, Dulany said.

Alaska's demerit point system calls for a 30-day license suspension for drivers convicted of traffic violations with a specified number of penalty points over a two-year period, he explained. The drivers targeted by the computer should have had their licenses suspended several years ago, but the suspensions were no longer current, he observed.

Dulany said DMV officials became aware of the problem in February, six weeks after the program had begun operating, but no action was taken then because the DMV's administrative committee did not consider it a priority.

Since Griffin's arrest, however, the computer has been reprogrammed by adding a special edit to the display program to suppress drivers' noncurrent records, noted Richard Judd, a programmer in the technical services group at the state of Alaska data center here. He said the cost of correcting the mistake was insignificant.

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Planning methodology helps Atlanta set DP priorities

By Paul Korzeniowski
CW Staff

ATLANTA — In 1984, the city of Atlanta's data processing department found itself in an all-too-common position: plenty of user requests but few resources.

"There was absolutely no way we could have completed all the projects that our users requested," noted Isaac T. Simmons Jr., manager of systems and programming at Atlanta's Office of Management Systems (OMS).

A principal reason for the problem was that each city department assessed its DP needs and submitted them to the Computer Applications Priority Board (CAPB), which selected the applications to be completed. The board consisted of the city's chief executive officer, commissioner of finance, commissioner of public safety, clerk of council, director of management systems and a city council representative.

"There were so many different priorities — such as the use of personal computers and a new payroll system — that the board had no method to determine which projects were most important to the city," Simmons said.

Rather than allowing city politics to determine which projects were undertaken, Simmons said, the board decided to implement the Business Planning System (BSP), a corporate information planning methodology devised by IBM in 1966. The methodology lists the steps a corporation should take to determine its most important DP needs. BSP attempts to transform the responsibility of setting DP priorities from the MIS manager to the executive task force.

The keys to BSP implementation are top-level management commitment and participation. "BSP would fail without top-level commitment," noted Keith Collier, an independent consultant who worked with the municipal government.

'Great vision or severe problems'

"Top-level managers have to delegate their responsibilities and work strictly on BSP for long periods of time. Because this sacrifice is needed, a company must have great vision or severe problems to implement this system," Collier said.

Forming a task force of top-level managers is the first step in the BSP process. "The use of a committee allows a business to look at itself rather than have an outsider try to determine how it functions," Simmons said.

The Atlanta task force consisted of the director of the Bureau of Motor Transport Services; the director of the Bureau of Budget and Management Analysis; the assistant chief at the Bureau of Fire Services; the deputy director at the Bureau of Police Services; the deputy director at the Bureau of Sanitary Services; the director of the Office of Engineering; the management services officer at the Department of Parks, Recreation and Cultural Affairs; and the acting director at OMS.

The committee's first meeting was held last June. For 16 weeks, task force members interviewed 45 top city officials and asked them to explain how they worked and to identify data vital to their jobs. "We talked to the head of each department including Mayor [Andrew] Young," Simmons said.

With this information, the task force attempted to determine the DP needs of the city rather than those of one department. A number of meetings were held and committee members discussed the city's most important information needs. "BSP helps a company break out of its file-based-system mentality and think in terms of integration and a data base," Collier noted. When priorities were established, each committee member wrote one section of a BSP report.

List of corporate goals

The report listed corporate goals that included adding two members to the CAPB, scheduling CAPB meetings in the summer and the fall, defining the relationship between the DP department and its user departments and increasing end-user computing among employees.

The next phase of BSP, which will be completed this month, establishes man-power and work requirements needed to implement BSP recommendations.

Simmons said the MIS department's next two projects are creating a personal computer support center and writing a new system for the city's fire department.

Although the study established these priorities, it did not hamper existing high-priority projects. The city planned to migrate from IBM's DOS/VSE to its MVS/XA operating system. "We know that the migration has to be completed, so as we finish it, we will begin to implement BSP recommendations," Simmons noted.

A BSP drawback is that it does not bring immediate results. "Atlanta won't even begin to realize BSP benefits for at least one and probably two years," Collier noted. "Before beginning BSP, a company should realize that it takes a great deal of effort to break out of 20-year-old thinking and technology. But BSP has supplied Atlanta with a framework for system development that will last for the next five to 10 years."

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E. F. Hutton underscores practicality in backup plan

By Donna Raimondi
CW Staff

Experience was the lead architect when E. F. Hutton & Co. built a new computer room as part of its disaster recovery plan.

The New York-based brokerage added a new computer facility that houses a backup IBM 3081 a few blocks away from its main computer room, according to John Newe, vice-president of data processing at E. F. Hutton.

The alternate site contains an IBM 3081, several printers and a microfilm center. It provides backup protection in case of fire, flood or other disasters, Newe said. The system is also on-line every day and is used in E. F. Hutton's worldwide operations, he said.

Newe's prime concern in building the new facility was putting in adequate floors, he said. The company's main computer space in Battery Park Plaza has a 6-in. raised floor, which has become inadequate for the increasing number of cables in the growing operation, he said. The new facility has a 12-in. floor, which will be able to handle the number of bus and tag cables needed for the 96-channel IBM 3090 machines that the company will eventually have, he said.

Three factors that contribute heavily to a successful computer room are space, power and air-conditioning, according to John Breyer, environmental field support manager at Digital Equipment Corp. "And the concept of margin is very important.

The major problem in the computer environment is that the computer site outgrows the air-conditioning or power," he added.

Air-conditioning central

When a site outgrows its air-conditioning capacity, the room becomes overheated, said Leroy Anderson, manager of air-conditioning at General Air-Conditioning and Heating, Inc. in Boston. Heat is the No. 1 enemy of computers, Anderson said.

In the summer when outside temperatures exceed the range in which computers can function, inadequately air-conditioned computer rooms start having overheating problems, he said.

E. F. Hutton solved its air-conditioning concerns by buying the most modern system it could find and by adding cooling towers on the roof of the new room's building, Newe said. Humidity for the room is controlled through the air-conditioning system, he said, so he did not have to add equipment for that.

Physical security for the system is important too, Digital's Breyer added, but that should be driven by the user's needs. Some companies expose their systems through glass walls so that the company's clients can see how high tech they are, he said. The fishbowl spaces are much harder to protect than strictly functional rooms, and the costs can get very high, he said.

E. F. Hutton's backup site is functional, not beautiful, Newe said. "Our security people have done away with the glass-walled computer room," he said. "We even took the name 'computer room' off the elevator wall" because of the bombings of computer rooms in New York a few years ago.

Newe's system is physically protected by a card key system that cost less than $25,000 to install. It is also protected by a guard system that costs approximately $15,000 per month, he said.

Fire plan — gas vs. water

As fire protection, Breyer recommended a well-documented fire emergency plan that everyone in the area knows, he said. "In my experience, most fires I've seen have not been in the computer — they've been in the trash," he said. Some larger sites even separate the printers from the main system to decrease the chance of serious damage from a paper fire, he said.

The decision to use either gases, like Du Pont Co.'s Halon, or water sprinkler systems rests with the user, Breyer said. Water dumped in the computer room makes a terrible mess to clean up, he said, but he still recommended a Halon-type system backed up with a water sprinkler system for large installations.

"I wouldn't agree with him," Newe said. "That has got to be a very expensive way to do it," he added. The Halon system in Newe's main computer location cost more than $1 million and took two years to install, he said. In his new room, he followed IBM's specifications and installed a dry sprinkler system that took two to three months to install and cost less than $100,000.

Another source of problems can be the power distribution, Breyer said. Surges of current can disrupt the flow of electricity. "Do not bother with an uninterruptible power source unless your business would be critically affected by a few minutes shutdown," he added.

Uninterruptible power sources are expensive and space consuming, although they are necessary for critical-function machines, he said. Running one feeder wire from where the power comes into the building to the computer room is optimal. If that cannot be done, power should be connected to the nearest main power point to the computer room, he said.

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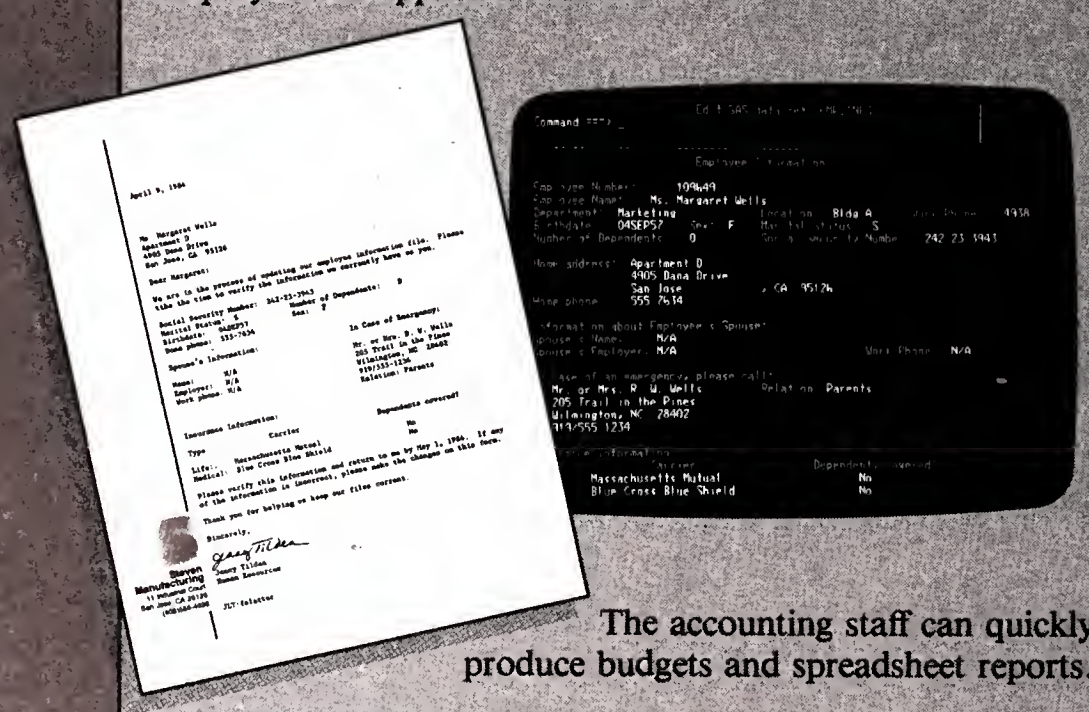
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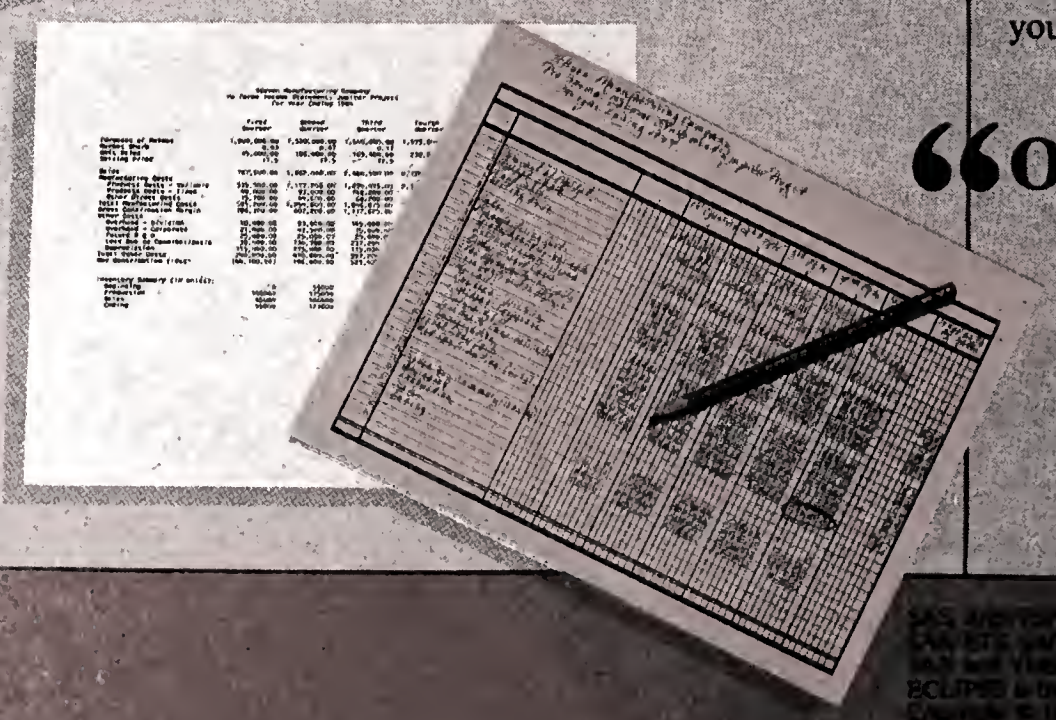
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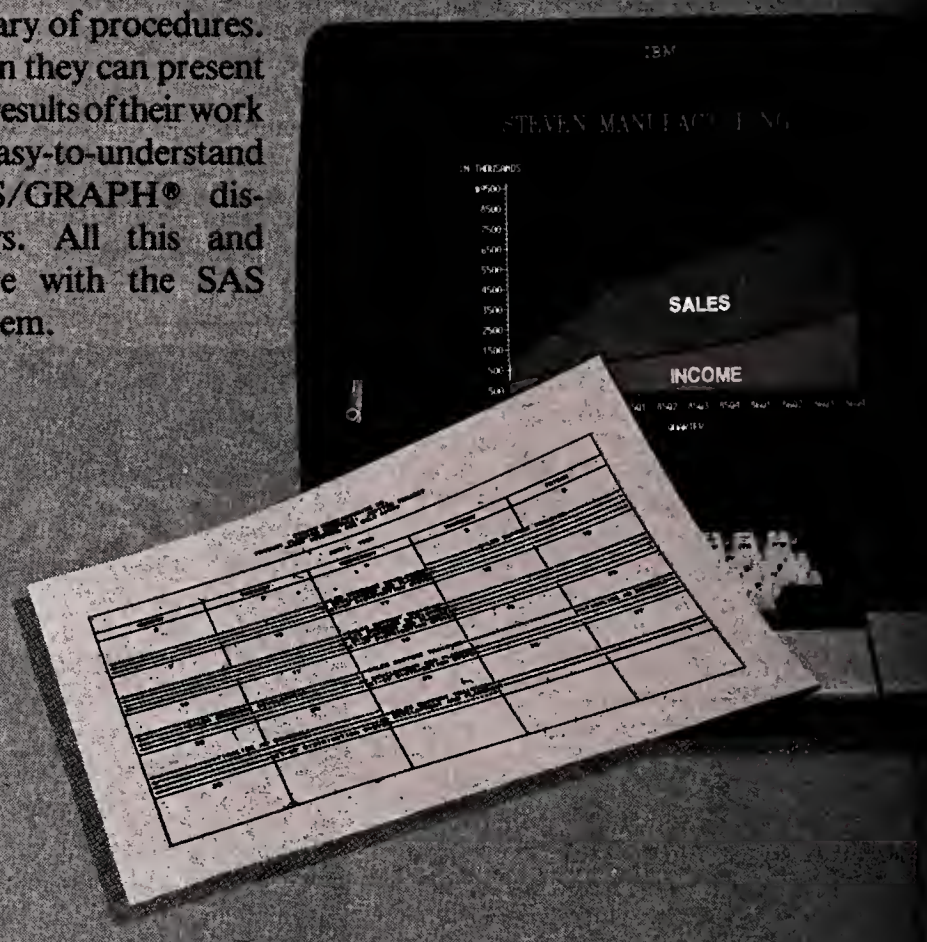
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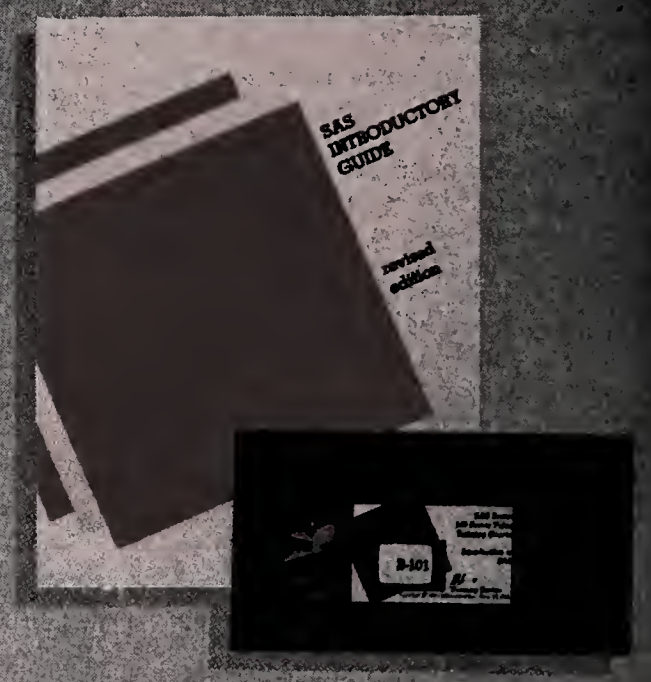
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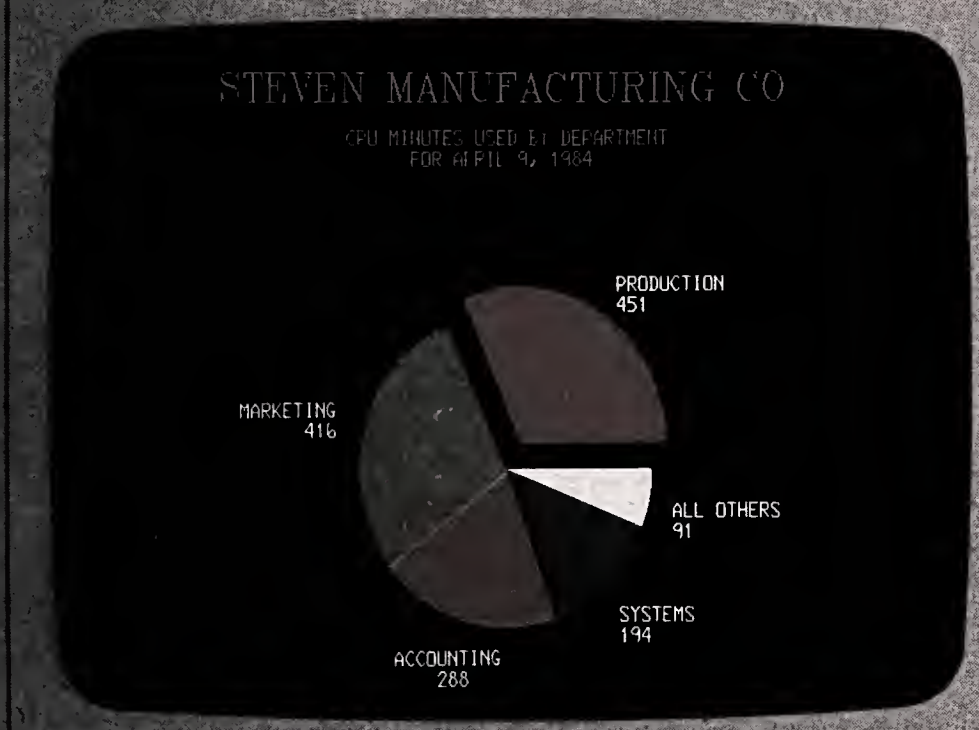
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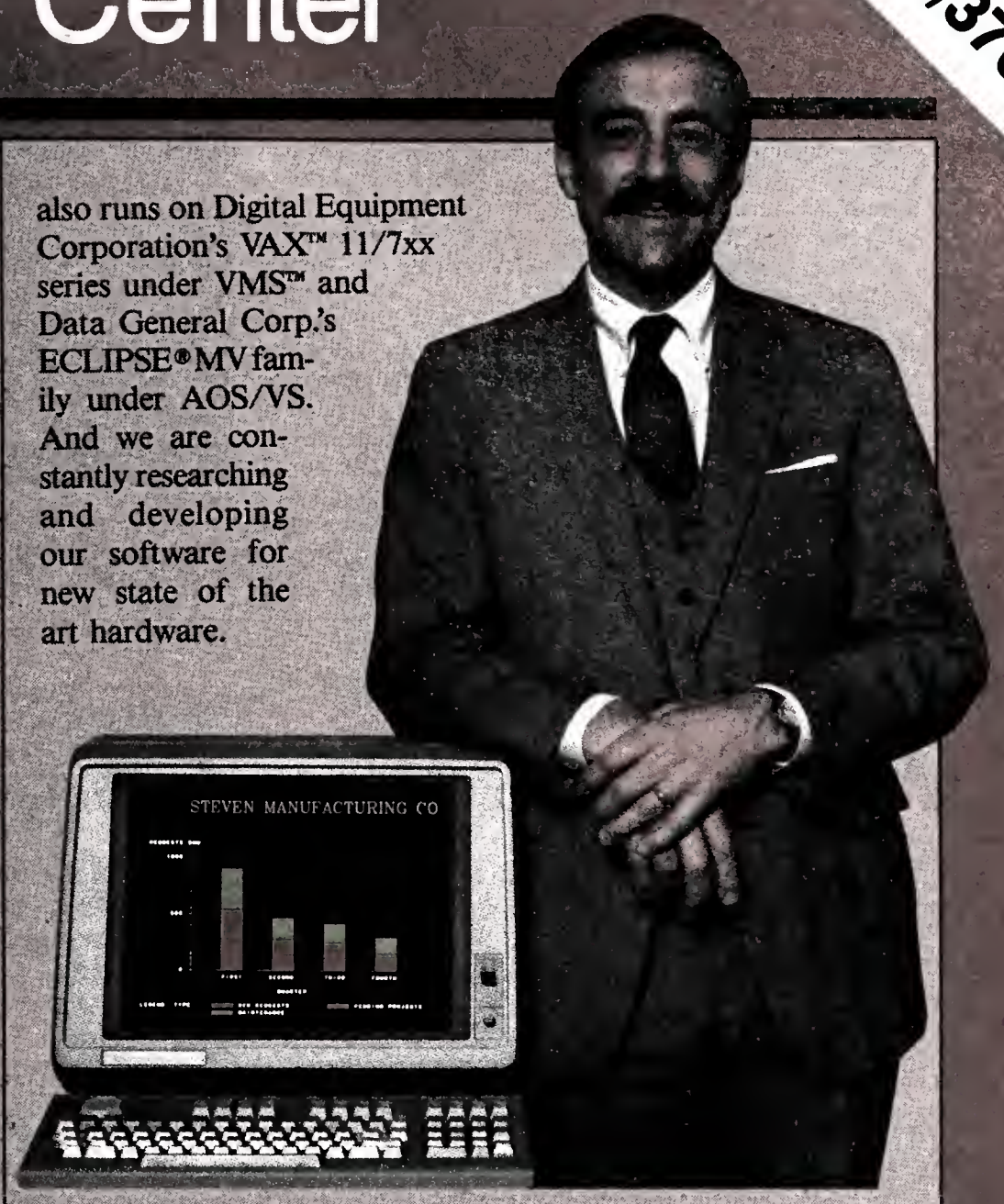
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		CPU MINUTE			I/O COUNT	
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	JACCT210	7	38.97	5.57	34968	4995
	JACCT220	6	103.95	12.99	74237	9280
	OTHER6	25	113.76	4.55	56085	2243
HUMAN RESOURCES	OTHER5	16	31.00	1.72	50314	2795
LEGAL	OTHER6	16	17.00	1.06	8218	514
MARKETING	JMKTG170	3	31.35	10.45	13557	4519
	JMKTG200	9	145.36	16.15	159131	17681
	JMKTG215	8	82.33	10.29	43768	5469
	JMKTG220	7	67.01	9.57	132357	18908
	OTHER8	21	89.95	4.28	100880	4804
PLANNING	OTHER5	17	43.00	2.53	27479	1818
PRODUCTION	JPROD200	12	80.47	6.71	107271	8939
	JPROD500	7	170.00	24.29	89020	12717
	JPROD650	4	56.35	14.59	91561	22890
	OTHER5	24	142.18	5.92	108352	4515
SYSTEMS	JSYS525	4	38.47	9.62	22519	5630
	JSYS620	4	24.62	6.15	39212	9803
	JSYS700	4	47.36	11.64	41780	10445
	JSYS850	4	49.67	12.42	40256	10064
	OTHER5	17	33.88	1.99	114291	8723
ALL JOBS		222	1440.00	6.49	1366608	6156



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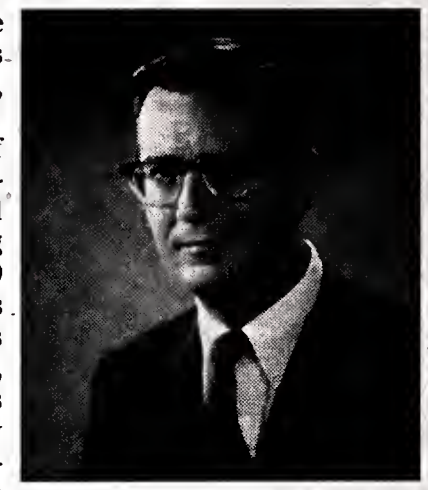
By Charles Babcock
CW New York Bureau

NEW YORK — New York Life Insurance Co. agent Leon Slotin remembers when he had to maintain a file of client names manually and write a letter to the home office when he needed a sales illustration.

That's not the case anymore. Slotin is one of 3,000 agents affected by New York Life's drive to place an IBM Personal Computer or Personal Computer XT on each of its agents' desks. With it Slotin does his own sales illustrations, maintains an electronic client file and taps New York Life's mainframes for information.

"If you told me I would be doing this three years ago, I would have laughed at you," he said recently from his office in Savannah, Ga.

Slotin was one of the first at the company to buy a Personal Computer. Getting 3,000 of the 10,000 New York Life agents to take the step has been no pushover, company officials said. Although closely tied to the home office, the agents are still self-employed and must buy their own desktop systems. A year ago, a Personal Computer XT, software, printer and modem purchased through the company cost $6,500, according to New York Life.


Driscoll

New York Life encourages the agents to make the purchase by buying Personal Computers in volume and passing on an IBM discount. The company is also willing to finance the purchase over three years at 6% interest, said James P. Driscoll, the New York Life vice-president in charge of the personal computer drive. Two price cuts of from $600 to $1,000 on the Personal Computer and Personal Computer XT since last April have been passed on to the agents, Driscoll added.

According to Driscoll, the agents receive three software packages that enable them to put their Personal Computers to work with minimum training. They use programs tailored by independent software houses for sales illustrations and client and prospect files, Multimate International Corp.'s word processing software and a communications program.

The nature of life insurance has changed drastically in recent years, with such financial packages as the industrywide universal life or New York Life's version of that package, Target Life, introducing annual variables into a policy, Driscoll said. "My feeling is you can't sell that product without an automated illustration package," Driscoll said.

Having placed some of the tools an agent needs on his desktop, New York Life is trying to enhance these tools by tying them more closely to the home office's mainframes.

As the Personal Computer drive got under way, New York Life had in place its Facts network, which linked its Clinton, N.J., data processing center to 220 New York Life general offices around the country. IBM 3270 terminals in the general offices could exchange data with the center's mainframes.

Network upgraded

New York Life is now upgrading the network by putting an IBM Series/1 minicomputer in the general offices — 70 have been installed so far — and linking the agents' Personal Computers to it through a terminal-emulation package.

"Now an agent can dial into the Series/1 at the cost of a local telephone call and talk to a host computer," Driscoll said.

New York Life has five IBM 3080 series mainframes in its data center: two 3084s, two 3081s and a 3083. It built its network around the Series/1s and Personal Computers to ensure that they can communicate with the mainframes, Driscoll said.

New York Life may upgrade the agents' options by offering them the Personal Computer AT with multiuser capability. But the company is not certain the AT will run all elements of its software package, and it could not obtain as many ATs as it needed at this stage, Driscoll said.

Of its 10,000 agents, only 3,500 have the four years experience recommended before buying the Personal Computer system. Most of the 500 or so agents who do not yet have a Personal Computer will get one by the end of the year, Driscoll predicted.

The company has mimicked the tactics of independent micro owners by forming user groups within the company, putting out a newsletter that troubleshoots problems and even establishing a home office hot line.

Slotin said he encountered a few glitches in the early days of using the software but that now there is no turning back from the Personal Computer path.

"I couldn't exist without one," he said.

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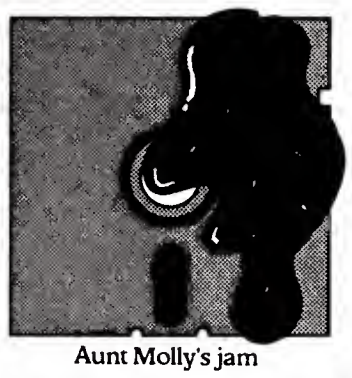
Realia COBOL. What a relief.

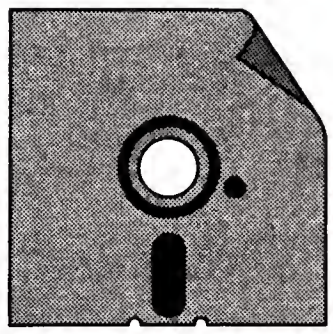
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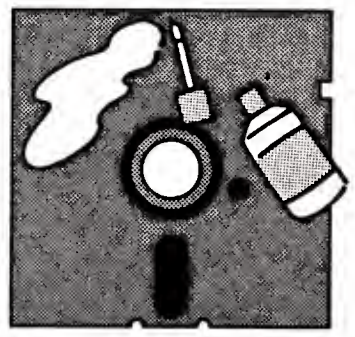
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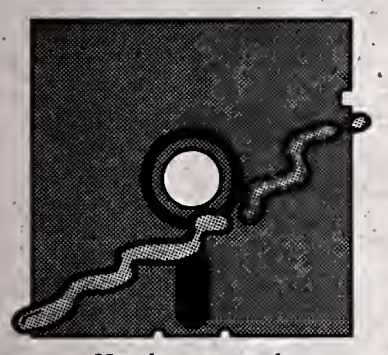
Give us your stained, your dog-eared, your filthy dirty, your mistreated:


Aunt Molly's jam

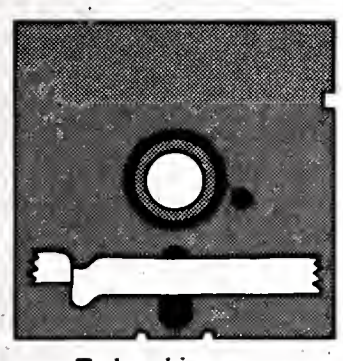

Dog-eared jacket

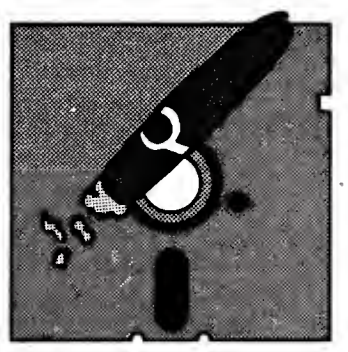

Regular coffee, two lumps

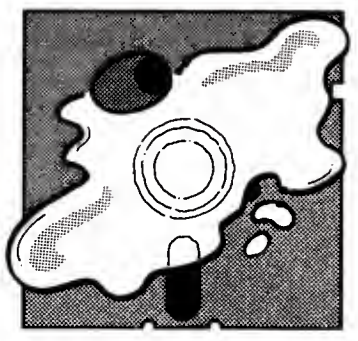

Maria's liquid cover

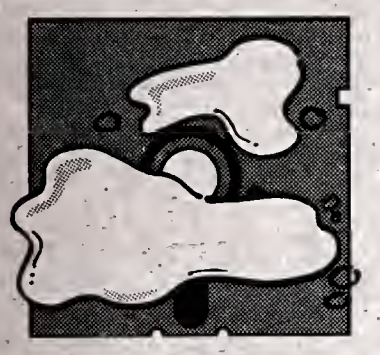

Hot dog mustard

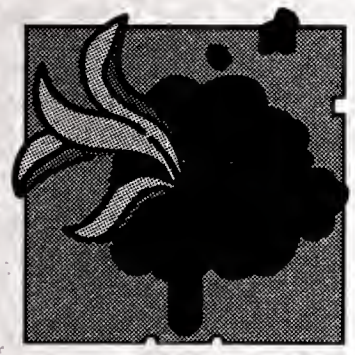

Dust (cough-cough)

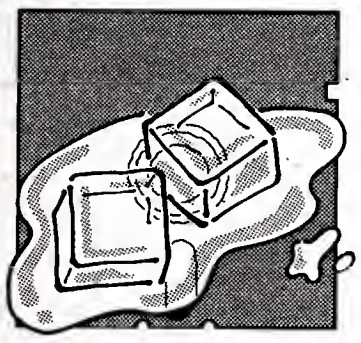

Tacky white tape

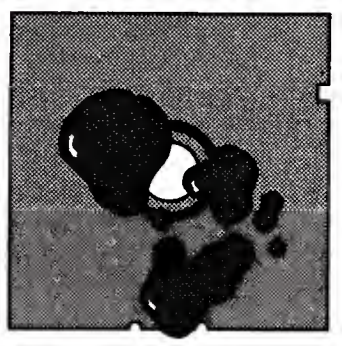

Boss's cigar ashes

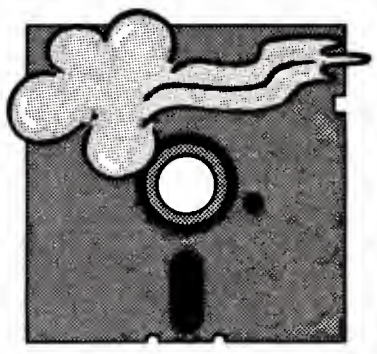

Dry martini, one olive

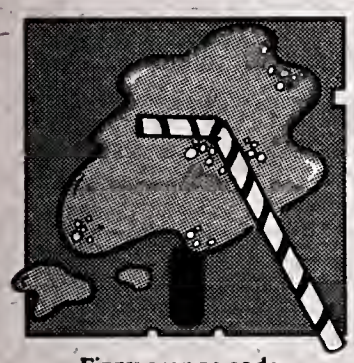

Spilled milk

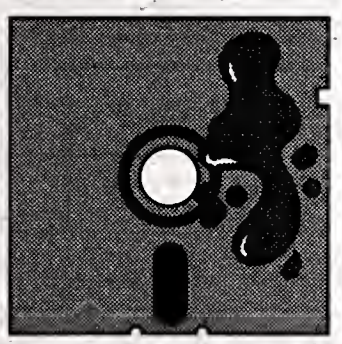

Potted plant–no pot

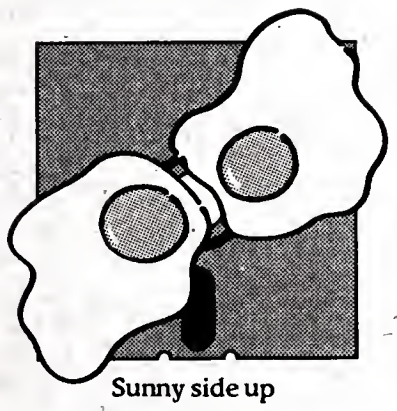

The big chill

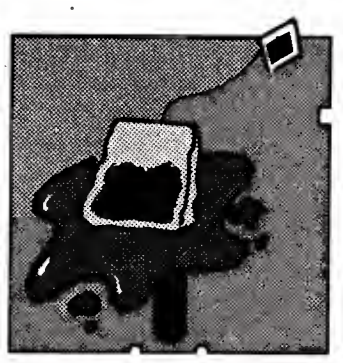

Lunchcounter ketchup

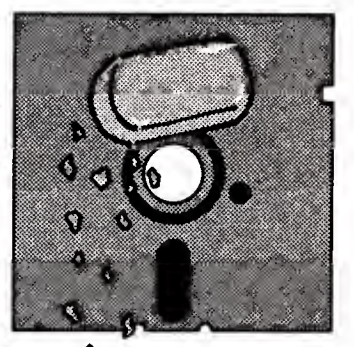

Clouds of smoke


Fizzy orange soda

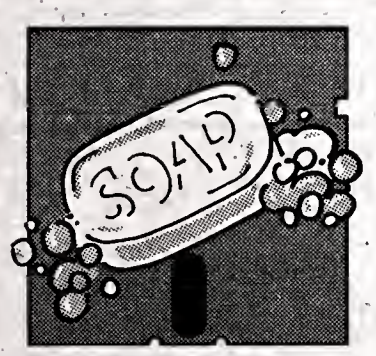

Waterbased ink spots


Sunny side up

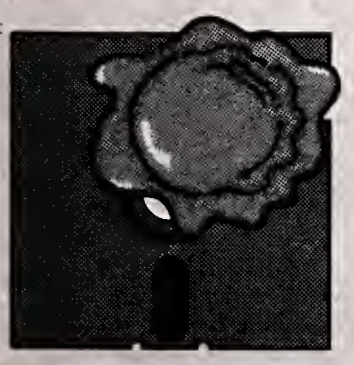

English breakfast tea

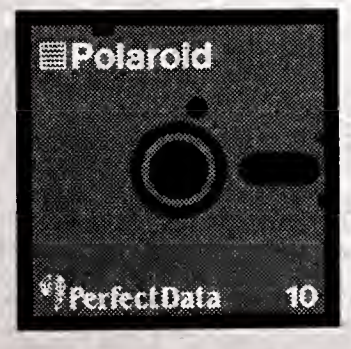

Eraser bits


Chocolate fingerprints



Sudsy soap bubbles


One scoop of ice cream



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NEWS

INTERNATIONAL REPORT
CW International News Network

AUSTRALIA

MELBOURNE — An exploding applications backlog has got Telecom Australia chomping at the bit for Honeywell, Inc.'s latest high-end mainframe release.

The vendor's DPS 90 system, priced at $6 million, is in the country and being readied for installation at Telecom. A spokesman said Telecom could not wait the anticipated two years for other vendors, including IBM Australia Ltd., National Advanced Systems Pty. Ltd. and Burroughs Ltd., to provide similar high-end power. The Honeywell machine is thought to be the first IBM Sierra-equivalent to be delivered outside the U.S.

■

PYMBLE — A pioneer among Australian hardware manufacturers, Digital Electronics Pty. Ltd., has been acquired by General Robotics Corp. of the U.S. The new owners are expected to continue to build and support Digital Electronic's product line.

CANADA

TORONTO — Changes in Canadian copyright legislation that reduce to five years the length of copyrights, could seriously hamper the country's growing software industry, according to the Canadian Business Equipment Manufacturers Association. The association prepared this statement for a parliamentary committee now studying prospective changes to copyright law. The group argued that Canada has the potential for a booming software industry but only if developers receive the same protection afforded them in other countries.

CHINA

BEIJING — Hitachi Ltd. has signed an agreement with China's Railway Science Academy to develop jointly a Chinese version of the Hitachi microcomputer. This announcement followed a similar agreement struck by Japan's NEC Corp., which will assist the Huabei Terminal Co. in mass-producing the NEC PC-9801 microcomputer for the Chinese marketplace.

■

CHANGCHUN — China's first Software Fair will be held here April 20-26. More than 100 software companies are expected to have exhibitions at the show, including representatives from Hong Kong and U.S. firms.

■

GUANGZHOU — The Chinese Computer User's Association recently held its first conference. The conference reportedly brought together approximately 40 domestic and 15 foreign computer manufacturers to hear from the Chinese user community.

A spokesman from IBM China, Inc. called the event "the most valuable meeting [we've] ever attended in China." During the meeting, good-service certificates were awarded to IBM, Wang Laboratories, Inc., Digital Equipment Corp., Hewlett-Packard Co., NEC Corp., Hitachi Ltd. and Honeywell, Inc.

DENMARK

COPENHAGEN — Low salaries paid by Denmark are making it very difficult to hire qualified personnel to develop the newly formed Financial/Computer Science Institute at the Copenhagen School of Economics and Business Administration. Denmark needs people with practical and scientific expertise from the commercial community, but, according to industry figures, such people would have to take an average $500 per month pay cut to work for the government.

FRANCE

PARIS — Nearly 1,000 people convened here recently for the European Unix Users Group (Euug) meeting. In France, it is estimated there are 5,000 sites operating with AT&T's Unix system, but the most popular version of Unix appears to be the Fortune 16/32 system from the French company Thomson. Olivetti Corp., which sells AT&T's 3B system in Europe along with Unix, recently lost its largest OEM distributor here, Metrologie, and is having trouble moving the products, according to sources.

■

PARIS — France recently approved a software protection law that automatically prohibits all software from being copied. Prior to this law, it was only illegal to copy software for resale. Industry insiders said they are anxious to see how the law will be received by the computer community and how it will be enforced.

JAPAN

TOKYO — Japan produced 12,752 mainframe units during 1984, valued at $2.6 billion, according to a recent Ministry of International Trade and Industry report. Japan also produced some 54,000 office systems, estimated to be worth $500 million, and one million micros valued at $900 million. The peripherals industry amounted to 10 million units and is worth $4.3 billion, the report stated.

■

TOKYO — NEC Corp. has unveiled a 32-bit high-end office system called the System 150/88. The machine features up to 8M bytes of main memory, integration of micro and mainframe functions, compatibility with Japanese office and color serial printers and extensive communications capabilities, according to the vendor. A typical configuration costs $65,000.

NORWAY

OSLO — Norsk Data AS and Ericsson Information Systems, Inc. are cooperating on a contract from Norwegian Post Office Administration. The order initially calls for 2,000 workstations to be installed in Norway's 450 larger postal branches, with other equipment phased into the country's remaining 2,350 post offices.

SWEDEN

STOCKHOLM — Apple Computer, Inc.'s business is booming here, according to Soeren Olsson, Swedish company president. During the last quarter of 1984, Apple claimed a microcomputer market share of approximately. 30%, with sales of 1,780 units valued at $5 million.

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NEWS

Mini-based system Rx for druggist's billing backlog

BAINBRIDGE, Ohio — As owner of the only pharmacy within 20 miles of this town of 1,000 residents, John Knisley provides a much-needed service for the 3,000 families here and in surrounding communities. Although the relaxed, small-town setting allows Knisley to know his customers by name, the pace is often hectic at Knisley Pharmacy.

Knisley fills more than 100 prescriptions a day — nearly 50% more than most one-pharmacist operations, he claimed. Until recently, that meant 65- to 70-hour workweeks, with take-home paperwork.

Knisley spent a great deal of time each week filling out forms for third-party billings. "Approximately 45% of the prescriptions I fill are billed to third parties, such as Medicaid, various insurance companies and the State Industrial Commission," he said.

The complexity of third-party billings led Knisley two years ago to consider purchasing a computer system for the pharmacy. Although Knisley Pharmacy had annual sales of $400,000, Knisley said he was at first doubtful that he could afford a computer for his business.

"But if it provided help with third-party billing, then the time savings would help justify the expense of a computer," he said.

Knisley considered pharmacy software systems from several companies before selecting the Retail Pharmacy Package from RNA, Inc., a Texas Instruments, Inc. reseller in Dayton, Ohio. RNA's software included third-party billing, inventory control, prescription filling and price updating.

> *'After I got the computer, I saw how lax [with price updates] I really was.'*
>
> — John Knisley

Knisley's hardware requirements included large mass-storage capabilities in order to keep detailed records for insurance and legal purposes. He also needed a printer that could withstand constant use.

Knisley purchased a TI Business System 372 minicomputer with a single terminal, 512K bytes of random-access memory and 43M bytes of mass storage. Knisley also chose TI Model 810 and Model 850 printers.

'It was simple'

Knisley said he taught himself how to use the Business System 372 by working at home with it in the evenings. "I loaded a lot of the information I needed at home over a period of several months. Then I brought it into the store one morning and hooked it up myself. It was simple."

Now, when a new prescription is called in, Knisley enters patient, medical and billing information on the Business System 372. For refills, he keys in only the prescription numbers. The Model 850 printer prints the prescription label, while the Model 810 prints a cash receipt or third-party billing form.

Knisley said, "Things were a little slower initially while I adjusted to computerization, but I can now fill two or three prescriptions in the time it used to take to fill one. Medicaid billing now takes about 10 minutes a week instead of eight hours," he added. "The time savings are phenomenal. My average workweek has been reduced by about 15 hours."

Increased profitability

Computerization has also provided an unexpected, measurable increase in profitability because of automatic price updates for prescription drugs. "I didn't know I had a problem with price increases until I purchased the RNA/TI system," Knisley said. "I thought I was really efficient with price updates. But after I got the computer, I saw how lax I really was."

Knisley discovered that he had been losing nearly 20 cents on each prescription filled because he was not passing price increases on to his customers. Now he receives monthly price updates from RNA that automatically change prices in the computer. "I've increased my gross margin of profit by approximately 2% in the prescription department just by keeping up with price increases," Knisley claimed.

Future plans for the system include the installation of a microcomputer that will connect with local nursing homes which can transmit pharmaceutical orders over the phone.

Knisley said the profit margin increase alone will cost-justify the system in 3½ years. "In fact," he said, "when I look at the profit increases, tax breaks, investment credits and the savings in my own personal time, the computer really doesn't cost me. I'd say it's making me money."

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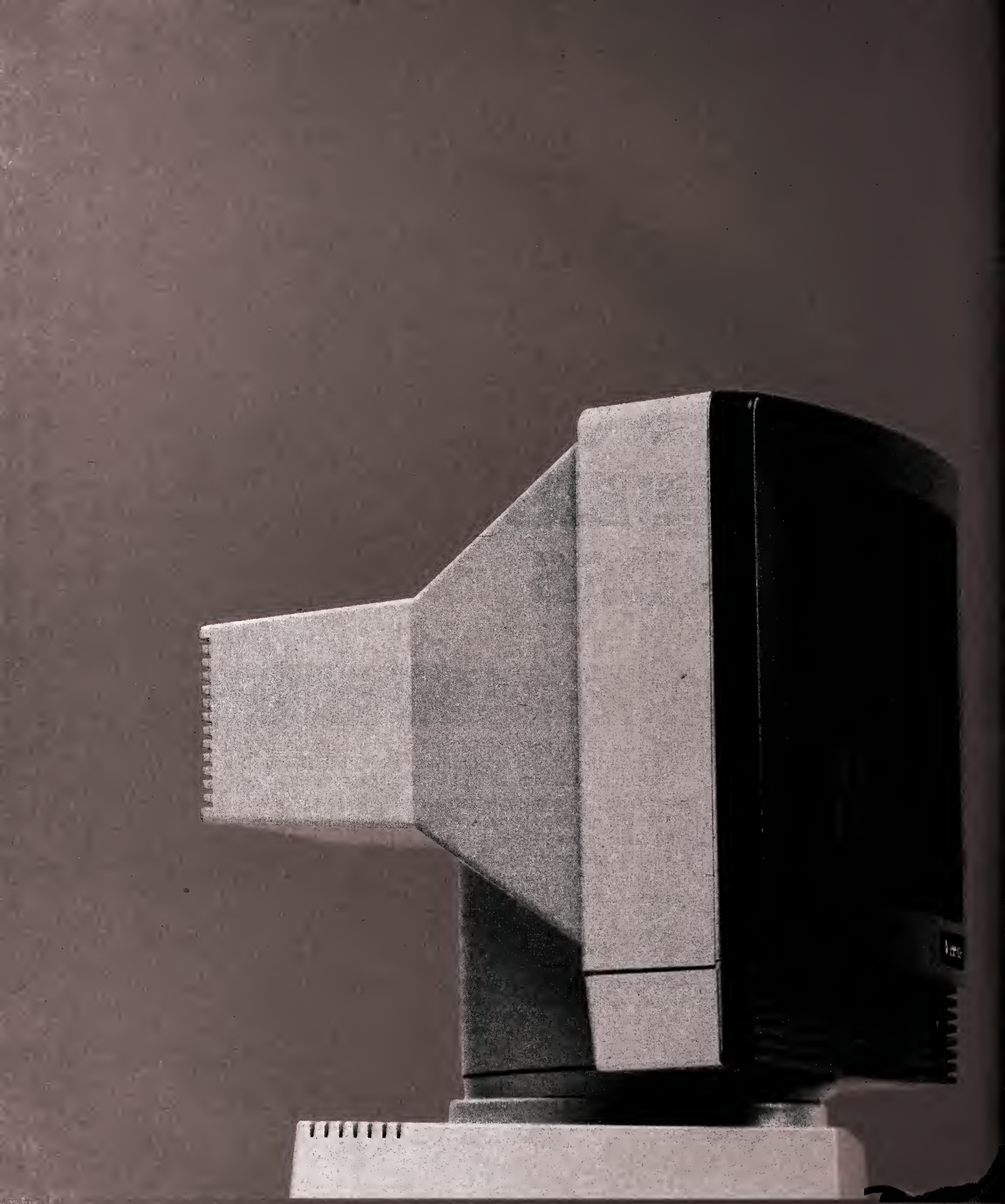
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NEWS

Shipping workers tell it like it is to hand-held computer

ST. PAUL, Minn. — In the movie *2001: A Space Odyssey*, the spaceship crew talks to the Hal 9000 computer to give it instructions. The 3M Distribution Center here has no Hal 9000, but it does have a voice recognition system used by truck drivers and forklift operators to input data in a manner that is reminiscent of the stuff of science fiction.

The plant is a central receiving center for outside vendors and 3M-supplied material for 3M manufacturing facilities in all states. The task of distribution center workers is to transfer incoming raw materials, parts, tools and assemblies to their destinations as quickly as possible.

Material should be shipped immediately after it is unloaded from incoming transport, but paperwork, coupled with ineffective data collection, was causing typical delays of two to eight hours in reporting and routing information to its proper destinations, according to Ron Johnson, data processing supervisor at St. Paul Manufacturing Services.

A team was selected to search for the solution to this problem. It was decided that an on-line computer system was required to streamline the paperwork bottleneck, but traditional video terminals did not seem best for data input, Johnson said.

It would have been difficult for warehouse personnel to enter data manually on incoming shipments at a keyboard while efficiently moving boxes and pallets from unloading areas to staging areas for reshipment. In addition, errors made in such manual data entry could result in misplacement or loss of loads or pallet information for hours, if not days. An effective technique was also needed to label the material for reshipment, Johnson said.

The team found that the solution required a number of technologies. All material coming into the facility needed bar code labels that could be generated on the unloading dock by a dot matrix printer. The labels could be read with hand-held data entry reading wands that feed data to a central computer for tracking and routing purposes. But traditional manual data entry methods to produce the labels were not practical on the receiving dock, Johnson said. He decided that a voice recognition system was the most practical. Employees could move or unload shipments by hand while directly providing data to the computer. And it would mean that labels could be printed immediately and affixed to loads.

The distribution center had a Hewlett-Packard Co. HP3000 processor on site, with dedicated time and in-house systems expertise for the Reship Order Tracking System (Rocs) devised by 3M. A vendor search identified MSI Data Corp. of Costa Mesa, Calif., as a leading supplier of hand-held computer terminals with bar-code scanning capabilities and Printronix Corp. of Irvine, Calif., as a leading supplier of high-speed dot matrix line printers that could generate the bar code labels.

Interstate Voice Products was identified as the supplier of voice recognition and synthesis equipment capable of withstanding the harsh environment of the warehouse, while providing the accuracy required to translate operator voice input into data for the computer.

Electronically spoken prompts

Communication between the MSI hand-held computer and the HP 3000 was facilitated by SAM, a speech-aided modem manufactured by Processing Innovation in Anaheim, Calif. With SAM, the operator is provided with electronically spoken prompts telling when to download the data and acknowledging successful data transmission. Communication between the operator and the voice recognition system was provided by an FM radio link with equipment supplied by Communications Applied Technology of Oakton, Va.

The system was installed a year ago and is working well, Johnson said. When a trailer arrives at the dock, its pallets are unloaded and placed in a receiving area. At that point, an operator reads the invoice number, origin of the load, destination and number of pallets into the headset microphone. The operator uses a 54-word vocabulary that includes all alpha and numeric characters, "yes" and "no," "dash" and control words like "enter," "send," "backspace" and "verify."

The computer voice confirms each item through the operator's earphones and enters the data into its memory. The computer then activates a printer that prepares pallet labels needed to get the shipment on its way. Besides the lettered information, the label also will have two identical bar code strips, one of which the loader tears off and affixes to the shipping documents.

The shipping document with the trailer identification number goes to a receiving clerk, who scans the bar code with a laser unit wired to the computer. The computer is then able to pass all of the information into its own storage.

"Our Rocs system has put us back in control of our operations. Employee morale has never been higher, and the transition from complaints to praise on our service levels and capabilities has been gratifying," Johnson said.

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WHERE IMAGINATION LEADS

NEWS

Concentrators let gas firms cash in on bank's network

PITTSBURGH — For Mellon Bank N.A. to make its Cashstream network available to customers at Amoco Oil Co. and Gulf Oil Corp. gasoline stations here, Mellon's mainframes had to communicate with point-of-sale (POS) terminals used by the petroleum firms.

In June 1984, Mellon, in conjunction with 15 Gulf retailers and six Amoco retailers in Pittsburgh, began a pilot program to test the feasibility of a retail debit network with oil companies. The bank had to find a cost-efficient way to handle dial-up protocols and concentrate the lines before the program could start.

At that time, Mellon's Cashstream system, one of the nation's largest shared electronic funds transfer networks, served 129 financial institutions, including commercial banks, savings banks, savings and loans and credit unions in Pennsylvania, New Jersey, Delaware, Maryland and West Virginia.

Mellon's switch transaction processors, four Tandem Computers, Inc. TXPs and four Tandem Nonstops, operated under IBM's 3270 bisynchronous protocol, while the POS terminals worked under Ascii asynchronous dial-up Visa protocol, a standard devised for credit card transactions.

"At that time, we decided not to modify the Tandem to facilitate dial-up protocols. We wanted to find the least expensive way to use the Visa protocols and concentrate the lines without modifying our present equipment," said Beverly Gross, product line manager in the product and development research section of Mellon's Network Services Division.

Solution found

Mellon's solution to the network problem was Icot Corp.'s Crystalink credit authorization/debit concentrators. The concentrators perform remote protocol conversion while concentrating multiple incoming local lines into a single leased line for transmission to the mainframe.

Tasks that can overload the host, such as answering incoming calls, polling terminals, sending error-checking messages and other simple functions, are performed by the Icot Crystalink box.

Gross said that Icot modified the box's software to support the Visa dial-up standard so that a retailer could conduct several transactions on a single call.

In describing the present network, Gross said that the 15 Gulf stations have Attala Secure Electronic Banking and Business Systems clerk-activated POS terminals, while four Amoco stations have customer or clerk-activated POS terminals from the Datatrol Division of Addressograph of Farrington, Inc. All the terminals are autodial, with printers and personal identification number (PIN) pads.

After the customer pumps the gasoline, the attendant passes the card through the reader. Then the customer enters the PIN number and the merchant enters the amount of the sale. The message travels through a 300 bit/sec. dial-up telephone call via AT&T 103 modems.

When the Icot Crystalink box receives the message, it converts the Ascii asynchronous Visa protocol to Ebcdic 3270 Binary Synchronous Communications protocol. The Tandem front end polls the Icot Crystalink box, which forwards the message. The Tandem then routes the transaction to the appropriate end point for authorization. The Icot Crystalink box receives the authorization response from the Tandem in Ebcdic 3270 protocol and returns it to the POS terminal in the Ascii asynchronous Visa protocol. The response time is from 20 to 25 seconds, Gross said.

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ASM three-day seminar offered in three cities

CLEVELAND — Richard Plasket, senior associate with Bauer & Associates, Inc., a consulting firm, will conduct a three-day seminar on Systems Project Management.

The conference is sponsored by the Association for Systems Management (ASM) and will be held May 6-8 in Sacramento, Calif., May 20-22 in Cincinnati and June 10-12 in Chicago.

Topics to be discussed include the approach to project management, project management organization, the project manager, network development and project plan development, implementation and analysis.

Registration for the program is $495 for ASM members and $575 for nonmembers.

More information is available from the Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

WIP international meet scheduled

WASHINGTON, D.C. — Congresswoman Barbara Vucanovich (R-Nev.), a member of the Republican Task Force on High Technology Initiatives, will deliver the keynote address at the international conference of Women in Information Processing (WIP), to be held May 8-10 at the Watergate Hotel here.

Other speakers on the agenda will include M. Mitchell Waldrop, a writer for *Science '85* magazine; Paula Brooks, president of Unitech Software, Inc.; and Louise Utsinger, assistant director of Source EDP, the national data processing employee recruiting firm.

The final day of the conference will feature a tour of Haar Industries' Paperless Office Technology Center, a facility reportedly used to acquaint managers with new trends in office technology.

Registration fees for the conference are $240 for WIP Forum members, and $290 for nonmembers. Additional information is available from the WIP International Conference, Lock Box 39173, Washington, D.C. 20016.

CALL FOR PAPERS

Sixth Annual System 1022/1032 Users Conference.
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Topics include, but are not limited to, the following: large data sets; nonstandard host language, network or graphics interfaces; performance issues; data set integrity; security; data base design; and educational use.

Abstracts on the various topics should be sent by May 31 to one of the following people: 1022 — Stan Braer, Harvard Business School, Bakers Library 21, Soldiers Field Road, Boston, Mass. 02163; 1032 or General — Nancy Meyer, Monsato Agricultural Products, 700 Chesterfield Pkwy., St. Louis, Mo. 63137; 1022 user demonstrations — Barbara Bersack, Software House, 1105 Massachusetts Ave., Cambridge, Mass. 02138.

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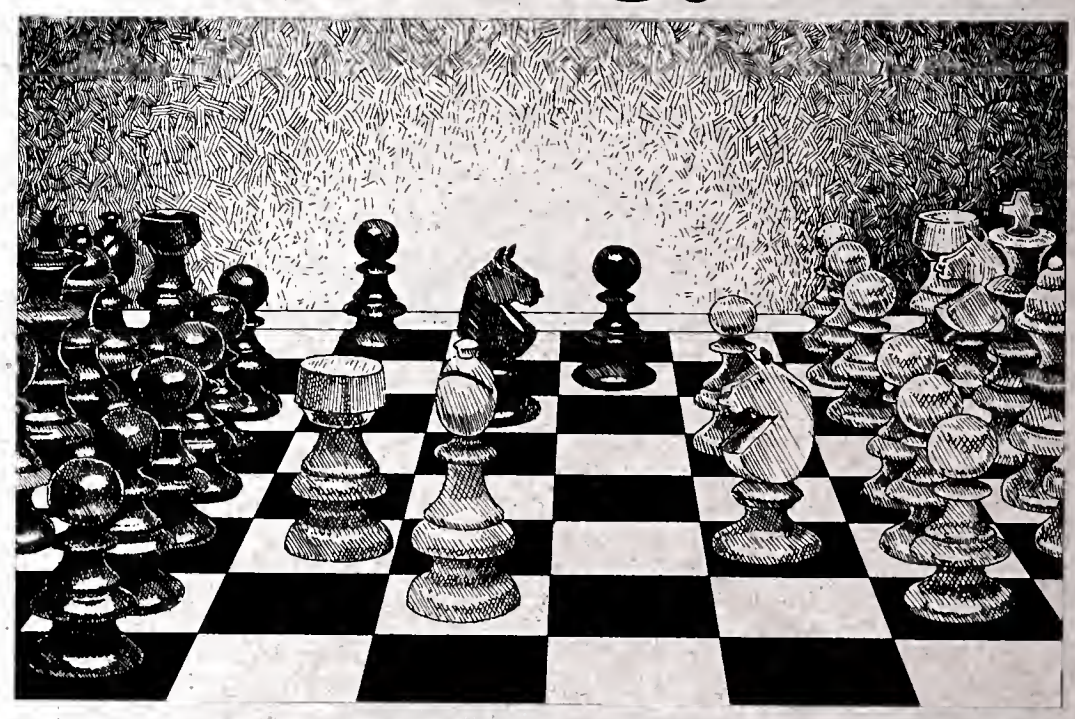
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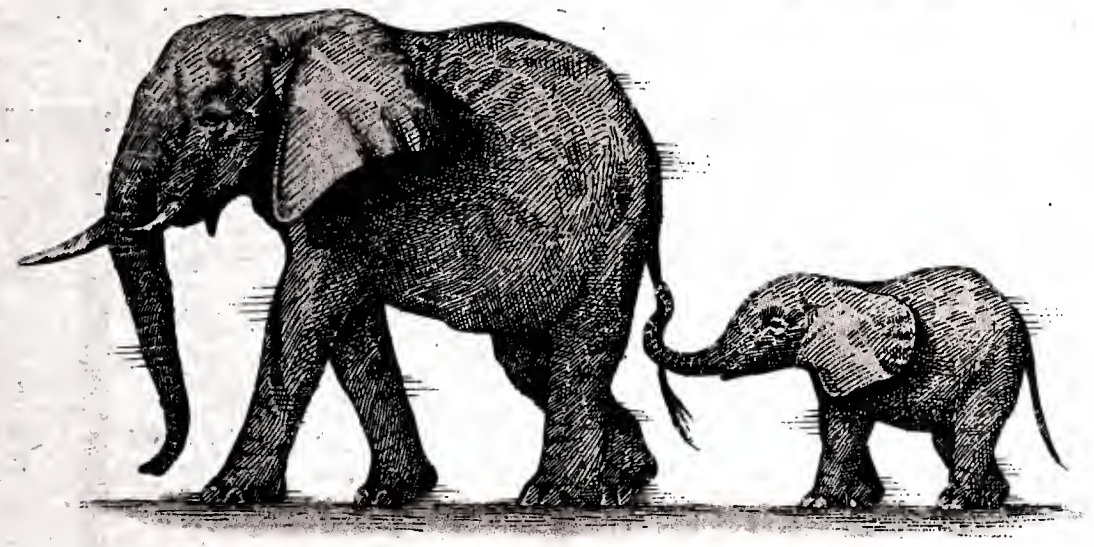
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NEWS

Emulation package ensures data access for firm's agents

INDIANAPOLIS — When American Life Insurance Co., located here, began searching for a terminal emulation product to link its agencies to American Life's mainframe, there was one feature that distinguished various vendor offerings.

"We wanted to allow agents to print data locally from the mainframe," said Karen Spears, network analyst at American. American Life did not want to require that a user complete a complicated file transfer routine to do that.

When the evalution took place, there was one product that provided the necessary feature: Bluelynx 3270 — a communications plug-in card and software package that permits an IBM Personal Computer to emulate an IBM 3276 terminal — from Techland Systems, Inc., located in New York. "We examined communications products from [other vendors]," Spears said. "They promised to offer the printing feature, but Techland was the only company that could deliver it."

Before the Techland Bluelynx 3270 products were added, American Life agencies across the U.S. had been equipped with Teletype Corp. 4240 remote terminals connected to American Life's IBM 3086JX mainframe by leased lines and modems.

Leasing expenses shared

The insurance company and the agents shared the leasing expense, and the agents used the remote terminals to access the mainframe for client data and to prepare policy sales proposals and applications, according to Spears.

Spears cited a number of limitations to the remote terminal system. Mainframe software limited the types of proposals that agents could create. For example, she said, sales illustrations with data, such as age and state of health of individual customers, had been produced by mainframe software. With a dumb terminal, an agent would key in the codes for a particular policy.

There was little opportunity for variation of personal data or cash values. If an agent wanted to develop policy information that deviated from a standard policy, he had to do the calculations by hand. Also, remote terminals were so limited that a policy had to be processed and printed at the main office overnight rather than printed at a remote location.

Logical solution sought

Dumb terminals did not provide stand-alone processing capabilities, Spears said. Tasks such as editing, typing, filing and billing, which are performed most efficiently on a word processor or personal computer, were completed manually, Spears noted. Consequently, acquisition of microcomputers that could communicate with American Life's host seemed to be a logical solution to these problems.

After the evaluation, four agents were supplied with IBM Personal Computers and Bluelynx 3270. American Life developed a software package that provides for more than 10 variations for a life insurance policy, allowing agents to be creative in their sales illustrations, Spears said.

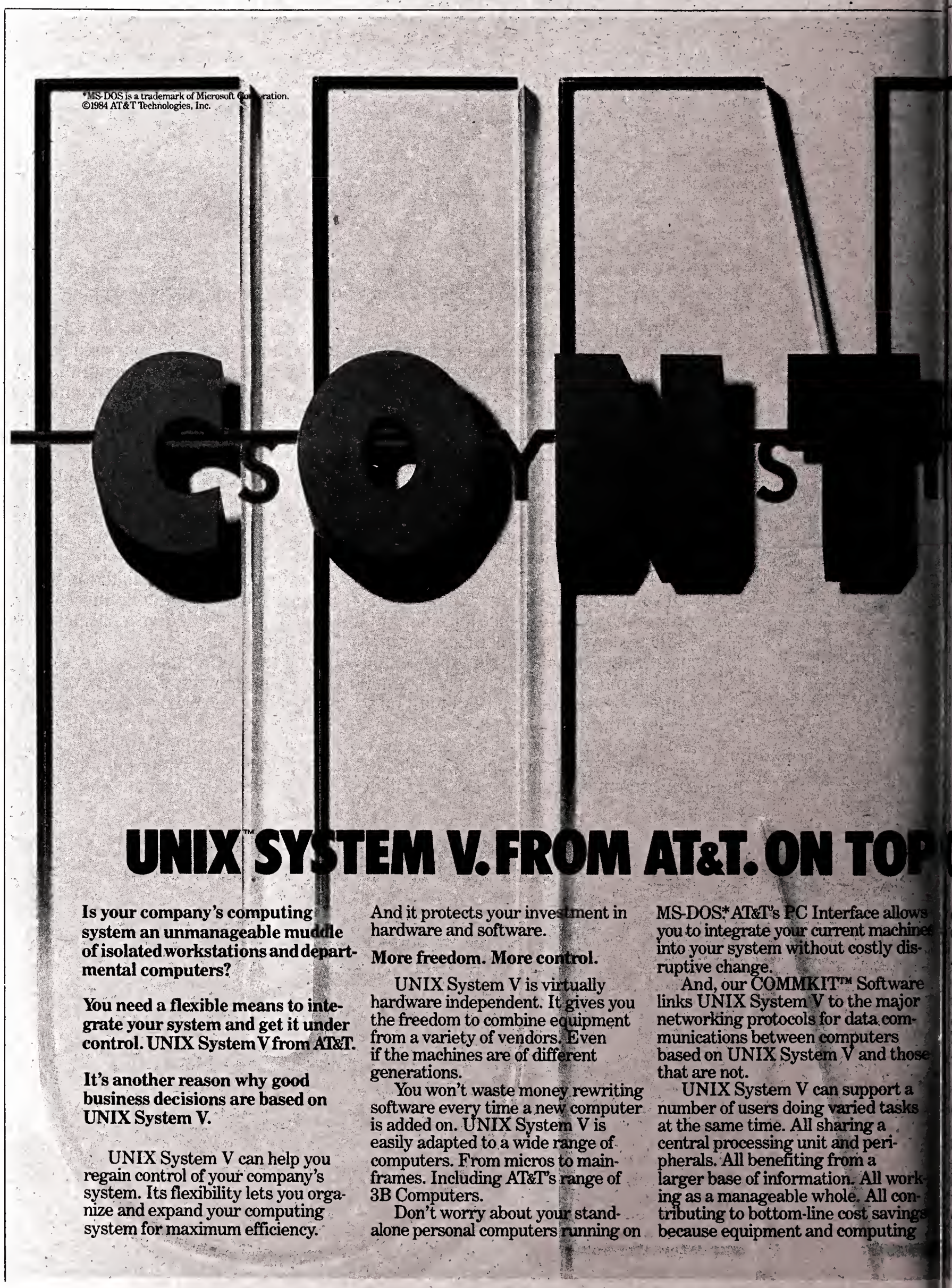
The insurance company also began offering seminars to familiarize the agents with the software package, the Bluelynx 3270 and the IBM Personal Computer.

Leased terminals eliminated

American Life saved money by eliminating leased terminals, according to Spears, and agents benefited by declaring their Personal Computers as tax deductions.

The four-agent pilot program was deemed successful, so American Life replaced 35 agencies' terminals with microcomputers.

As an added benefit, "we have signed some agents who previously were working for our competitors," Spears said, attributing that growth to American Life's new system.



NEWS

Pilot project presses publisher's conversion to minis

SAN FRANCISCO — A publisher of legal treatises used a pilot project to guide its conversion to a minicomputer-based automated system.

Matthew Bender & Co., a wholly owned subsidiary of Times Mirror Co., publishes information on statutes and court cases for attorneys and accountants.

In mid-1981, the company decided to automate and establish the pilot project at its offices here, where approximately one-third of the firm's editorial activity takes place.

Pamela Sallender, vice-president of the company's western editorial department, assumed responsibility for the project. For six months a team of executives studied more than 40 computer systems vendors.

'Not computer people'

"We needed a system that was large enough to handle the volume of data" produced at Matthew Bender, Sallender said. Other requirements included upgradable hardware and flexible and easy-to-learn word processing software. "Ninety-five percent of the people who work here are not computer people," she said.

The field of vendors was narrowed to five. The company selected Wang Laboratories, Inc. minicomputers, integrated with customized editorial software, to plan and produce its publications.

Matthew Bender began the pilot project with a Wang VS80 running 20 workstations, three printers, two 288M-byte disk drives, a tape drive and 512K bytes of memory.

For the next four months, a training program for users was developed, procedures for writers and editors were established, and the first chapters of manuscripts were put onto computer tape and encoded for use directly by outside compositors.

Five months after the pilot project began, Matthew Bender purchased two Wang VS100 computers with a combined 1M-byte memory. The company added 140 Wang Ergo II workstations, four 288M-byte disk drives and eight printers, and the upgrade went smoothly, Sallender said. "The files that we had created on the VS80 were directly loaded onto the VS100," she said.

Ten months later, the company added another VS100, four 288M-byte disk drives, a tape drive and 75 Wang Professional Computers. Finally, a Wangnet broadband local-area network was installed to connect the computers and peripherals into a system allowing communications among different computer systems.

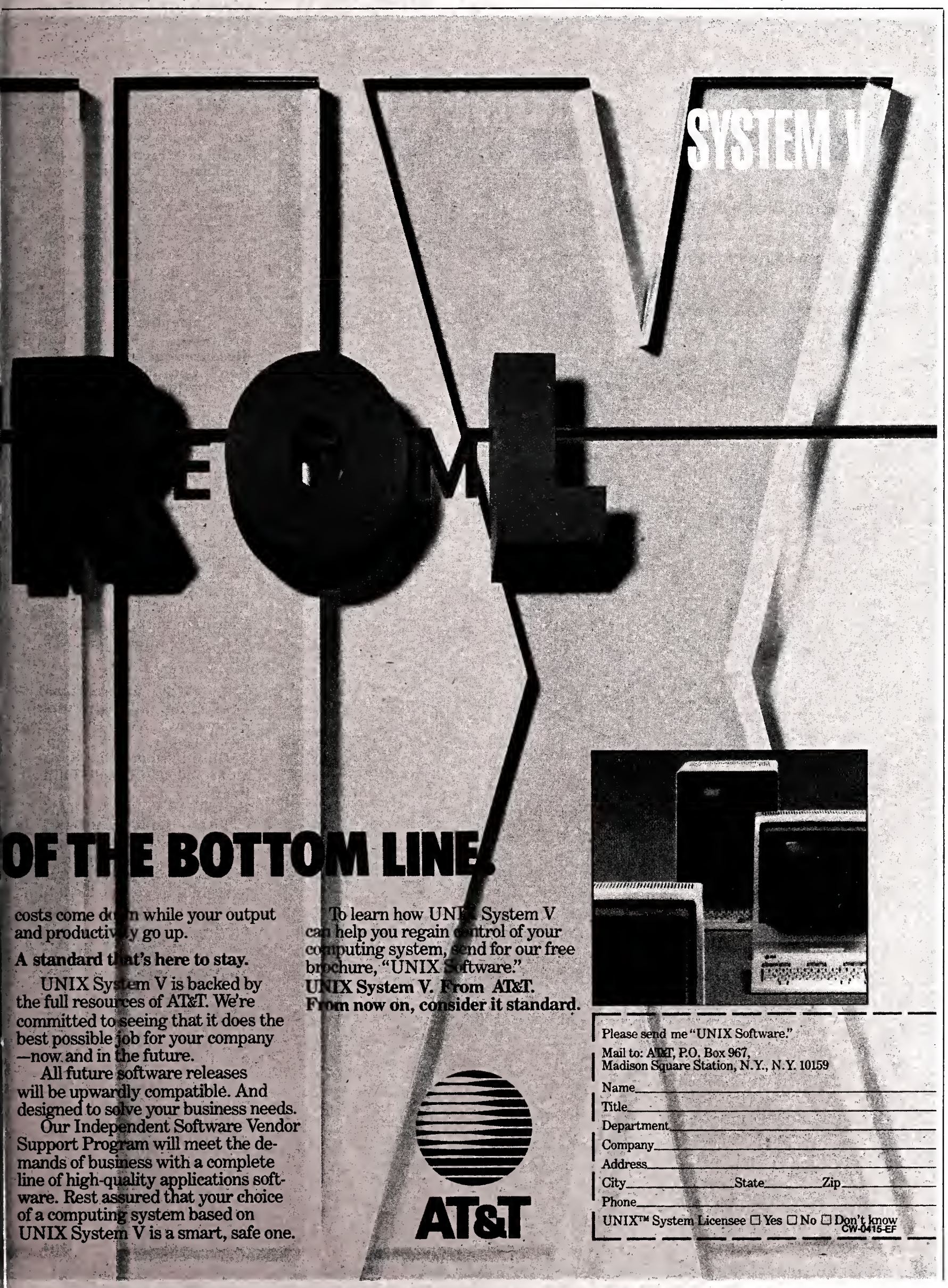
Tag changes electronically

Writers can store research notes and outlines on the system and compose and edit manuscripts on the workstation display screen. Editors call up a writer's manuscript on another display screen and critique it using a glossary feature to tag the suggested changes electronically for a particular section.

The process eliminated the old "cut-and-paste" method for editorial changes and the time-consuming procedure of sending piles of pages back and forth between editors and writers for review and approval, she said. "All the writers, editors and copy editors can access files on the VS system when necessary."

Automation also streamlined a proofing procedure with the company's New York production department, Sallender said. By eliminating the compositor's input, "We are saving six to seven dollars a page," she said. "With a productivity savings on top of that, we expect the installation to pay for itself in three to four years." The Wang system has also cut product delivery time from 15 to 10 weeks, Sallender said.

The San Francisco project has spurred a similar effort at the company's New York offices, where Wang VS100 computers were installed and have been in full operation since March.



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NEWS

CALENDAR

WEEK OF MAY 12

MAY 12-16, SEATTLE — **APL '85.** Contact: Robert J. Gailer, Apartment C, 2416 E. Madison St., Seattle, Wash. 98112.

MAY 13-14, DALLAS — **Using Dbase II and Dbase III to Manage Information.** Contact: Professional Development Institute, North Texas State University, P.O. Box 13288, NT Station, Denton, Texas 76203.

MAY 13-14, WASHINGTON, D.C. — **Software Rapid Prototyping.** Contact: Data Processing Management Association Educational Foundation Seminars, c/o Technology Training Corp., Department SRP, P.O. Box 3608, Torrance, Calif. 90510.

MAY 13-14, CHICAGO — **Understanding Telecommunications Technologies for Non-Engineers.** Contact: Telestrategies, Inc., Suite 102, 6842 Elm St., McLean, Va. 22101.

MAY 13-15, LOS ANGELES — **Relational Data Base.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

MAY 13-15, WASHINGTON, D.C. — **Introduction to Data Communications.** Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015. Also being held May 29-31 in San Francisco and May 29-31 in Houston.

MAY 13-15, NEW YORK — **The Associated Information Managers Fourth Annual Conference.** Contact: Associated Information Managers, 1776 E. Jefferson St., Rockville, Md. 20852.

MAY 13-15, NEW YORK — **Local-Area Networks.** Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015.

MAY 13-15, TORONTO — **Controlling Software Projects: Management, Measurement and Estimation.** Contact: Technology Transfer Institute, 741 Tenth St., Santa Monica, Calif. 90402.

MAY 13-16, FORT LEE, N.J. — **CICS/VS Logic & Debugging.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

MAY 13-16, DENVER — **Vtam: From Start to Finish.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

MAY 13-16, DENVER — **The Fifth International Conference on Distributed Computing.** Contact: Earl Swartzlander, TRW Corp., Defense Systems, One Space Park, Redondo Beach, Calif. 90278.

MAY 13-17, SAN FRANCISCO — **Data Base Development Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

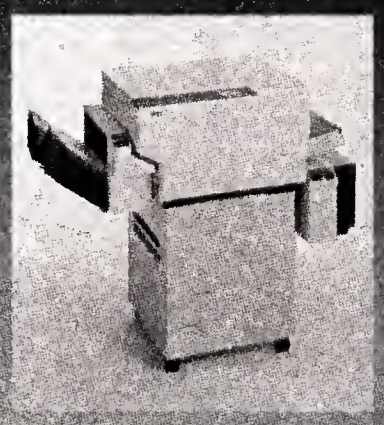
MAY 13-17, HOUSTON — **Structured Systems Analysis Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

MAY 13-17, WASHINGTON, D.C. — **Hands-On Programming in Ada.** Contact: The George Washington University, Continuing Engineering Education Program, Washington, D.C. 20052.

MAY 14-16, PARIS — **International Ada Conference.** Contact: Hans Horst, Virginia Polytechnic Institute and State University, Blacksburg, Va. 24061.

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NEWS

MAY 14-17, ST. LOUIS — **The Association for Integrated Manufacturing Technology's 22nd Annual Technical Conference and Exposition.** Contact: Association for Integrated Manufacturing Technology, Suite 800, 111 E. Wacker Drive, Chicago, Ill. 60601.

MAY 16-18, LOS ANGELES — **The Southern California Computer Faire.** Contact: David Small, Computer Faire, Inc., 181 Wells Ave., Newton, Mass. 02159.

MAY 15-16, AUSTIN, TEXAS — **MVS System Tuning.** Contact: Acts Corp., 11910 Gate Way, Austin, Texas 78727. Also being held August 22-23 in Dallas.

MAY 16-17, ATLANTIC CITY — **Software Maintenance.** Contact: Data Processing Management Association Educational Foundation Seminars, c/o Technology Training Corp., Department SMA, P.O. Box 3608, Torrance, Calif. 90505.

MAY 16-17, WASHINGTON, D.C. — **Personal Computer Local-Area Network Software.** Contact: Architecture Technology Corp., P.O. Box 24344, Minneapolis, Minn. 55425. Also being held May 22-23 in San Francisco.

MAY 17, LOS ANGELES — **Independent Computer Consultants Association (ICCA) Interconnections '85.** Contact: ICCA, P.O. Box 27412, St. Louis, Mo. 63141.

WEEK OF MAY 19

MAY 19-23, NASHVILLE — **Software Jamboree.** Contact: Software AG of North America, Inc., 11800 Sunrise Valley Drive, Reston, Va. 22091.

MAY 20-21, MONTEREY, CALIF. — **How to Manage Data and Information as a Resource.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

MAY 20-21, FORT LEE, N.J. — **CICS/VS Performance & Tuning.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

MAY 20-22, HILTON HEAD, S.C. — **Audit Managers Symposium.** Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

MAY 20-22, SILVER SPRING, MD. — **1985 Trends and Applications Conference: Utilizing Computer Graphics.** Contact: Trends and Applications '85, P.O. Box 639, Silver Spring, Md. 20901.

MAY 20-22, WASHINGTON, D.C. — **Vtam Concepts and Facilities.** Contact: Acts Corp., 11910 Gate Way, Austin, Texas 78727.

MAY 20-24, HOUSTON — **Structured Systems Design Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

MAY 20-23, VIRGINIA BEACH, VA. — **Navy/Micro OA '85.** Contact: Bostron Corp., Suite 716, 1511 K St. N.W., Washington, D.C. 20005.

MAY 20-24, BELLEVUE, WASH. — **C Programming Workshop.** Contact: Kathy Howard, Specialized Systems Consultants, P.O. Box 7, Northgate Station, Seattle, Wash. 98125.

MAY 21-24, PARIS — **Intelligencia International Exhibition and Congress.** Contact: Simtec Communications, 211, Rue Saint-Honore, 75001 Paris, France.

MAY 21-22, TARRYTOWN, N.Y. — **Technology and Market Forecasting in Electronics.** Contact: Futurecast Learning Center, 40 Birch St., Redwood City, Calif. 94062.

MAY 22-24, MONTEREY, CALIF. — **How to Build and Use a Data and Information Resource Directory.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

MAY 22-24, WASHINGTON, D.C. — **Management Skills and Techniques for New and Prospective Managers.** Contact: New York University, School of Continuing Education, 575 Madison Ave., New York, N.Y. 10022.

MAY 22-24, KYOTO, JAPAN — **International Conference on Foundations of Data Organization.** Contact: Yahiko Kambayshi, Department of Information Science, Kyoto University, Kyoto 606, Japan.

MAY 22-24, NEW YORK — **Network Protocols and Standards.** Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015.

MAY 22-24, WASHINGTON, D.C. — **Vtam Internals.** Contact: Acts Corp., 11910 Gate Way, Austin, Texas 78727.

WEEK OF MAY 26

MAY 28-30, KINGSTON, ONTARIO — **15th Annual Symposium on Multiple-Valued Logic.** Contact: H.T. Mouftah, Department of Electrical Engineering, Queen's University, Kingston, Ontario K71 3N6, Canada.

MAY 28-31, NEW ORLEANS — **The Seventh National DEC-Compatible Industry Exposition (Dexpo South '85).** Contact: Angela Wright, Expoconsul International, Inc., 55 Princeton-Hightstown Road, Princeton Junction, N.J. 08550.

MAY 28-29, CHICAGO — **VS Cobol II.** Contact: Sysed, Inc., One Park Ave., New York, N.Y. 10016. Also being held May 30-31 in New York.

MAY 28-31, SAN FRANCISCO — **CICS Application Design.** Contact: Sysed, Inc., One Park Ave., New York, N.Y. 10016. Also being held May 28-31 in New York.

MAY 28-31, NEW YORK — **TSO IPF.** Contact: Sysed, Inc., One Park Ave., New York, N.Y. 10016.

MAY 28-31, NEW YORK — **CICS Application Design.** Contact: Sysed, Inc., One Park Ave., New York, N.Y. 10016.

MAY 29-30, DALLAS — **Opportunities and Pitfalls.** Contact: Ken Orton, Future Computing, Inc., 8111 LBJ Freeway, Dallas, Texas 75251.

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EDITORIAL

PC2 arrival no cause for panic

"PC2 is coming, PC2 is coming."

The air these days is charged with speculation about the forthcoming introduction of IBM's Personal Computer successor. The decibel level of the hype is approaching that of hysterical New Englanders who believed themselves under attack in the film *The Russians Are Coming, The Russians Are Coming.*

Does IBM's recent record warrant this excitement? Will PC2 repeat the undeniable success of the Personal Computer or the undeniable failure of PCjr? IBM's spotty record provides few hints of PC2's reception in the market. Consider the following:

■ Two years ago, IBM came out playing hardball in the personal computer market. Now it's the dominant player, having legitimized and effectively taken command of a nascent market. The IBM Personal Computer has become the definitive personal computer — no flash, no splash, but setting the standard and the direction for the entire market. A month ago IBM discontinued production of PCjr [CW, March 25]. Born in November 1983, the machine was unable to secure significant market share in the treacherous home market.

■ IBM in early February rolled out its two top-of-the-line mainframes, one available in seven months, the other in 24 months. Less than eight weeks later, Burroughs Corp., Honeywell, Inc. and National Advanced Systems Corp. served up processors that were faster, cheaper and generally available quicker than IBM's Sierra models.

■ Early indicators of IBM's plans for global data processing — the 4300/8100 distributed processing scheme, for instance — seem to have been put in abeyance, waiting for more complete cabling and network schemes, while IBM focuses on the office, tying together its Personal Computer and the System/36.

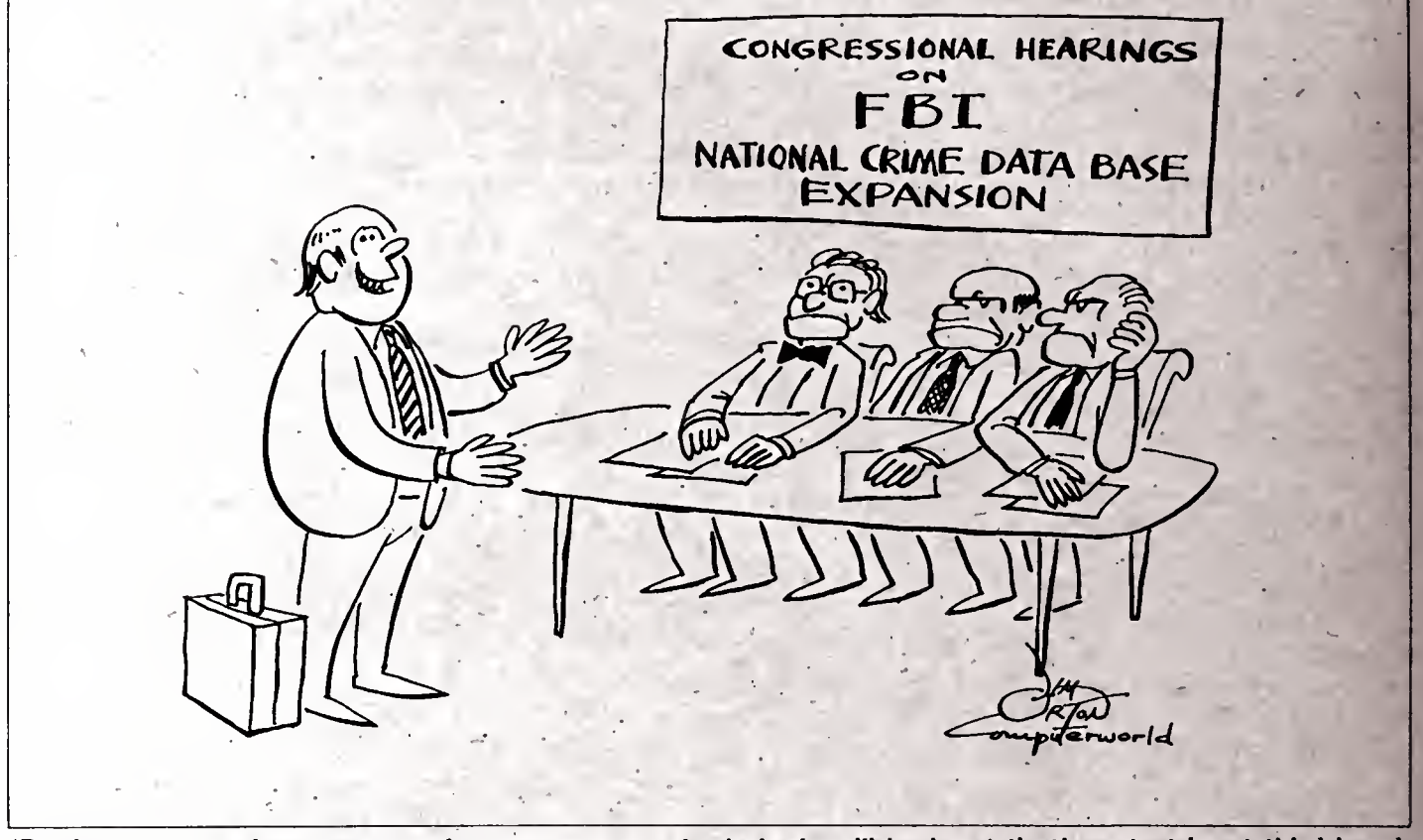
When you're the biggest kid on the block, you don't have to play the game by anyone else's rules. If you're big enough you can change the rules, change the game. With a strong enough position, IBM doesn't have to compete with its market rivals; it merely has to change the market itself.

This is clearest in the mainframe market, where the large-scale competition doesn't breathe without looking at IBM. In that game, the color of the home team is blue. It has been a long time since IBM actually had to compete against anyone in that market: IBM does what it does, and everyone else reacts.

■ The minicomputer market grew up without IBM and for a long time was nothing but boisterous and lively. But now that market is maturing rapidly. The numbers are changing; mini makers are facing down profit figures. And as IBM accelerates the pace with its links between the System/36 and its Personal Computer, that market probably faces the most radical change when the PC2 is born.

In mainframes and in personal computers, IBM is the dominant marketplace force. But as the PCjr pointed out, being the biggest guy on the block with the lowest cost production capabilities, the fattest advertising budget and the greatest market exposure doesn't spell success every time.

IBM has accumulated the power and the influence to sway certain marketplaces. The home market so far has been impervious to IBM's attentions; after all, IBM's middle name is *Business* — not *Home.* The PC2 will be a business machine, targeting a market where IBM stands tall, and its introduction should be marked by calm appreciation, not by panic among competitors or surprise among users.



'Don't worry, gentlemen — no data on suspected criminals will be input that's not at least third-hand, unverified, speculative hearsay!'

LETTER

Computer crime council supported

The article "Theft of $100,000 traced to credit bureau system tap" [CW, Jan. 14] underscored the comments that Walter R. Kurth, president of Associated Credit Bureaus, made in *USA Today*. He said there is a "mounting sense of urgency. . . . It's time to look at additional steps" in security and legislation to put a cap on computer crimes. He suggested that credit bureaus in the U.S. establish a council to fight computer crime.

As a former member of the Committee on Computer-Related Fraud and Abuse of the President's Council on Integrity and Efficiency, I support such a council.

In this age of information, people and machines are in a direct, continuous partnership, forming information systems that are highly effective and productive. However, today's on-line information systems bring added risks that many executives fail to recognize.

The American Institute of Certified Public Accountants recently surveyed financial institutions and insurance companies to determine the extent of computer-related fraud in those communities. Not all those organizations responded: only 5,127 banks and 854 insurance companies. But those that did provided the following alarming statistics:

■ Most reported that computer-related frauds were perpetrated by insiders.

■ Twenty-six percent of the reported cases had been on-going for more than a year.

■ Sixteen percent of the reported cases involved dollar amounts greater than $100,000,

See **LETTER** page 44

COMPUTERWORLD

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VIEWPOINT

Users trail galloping progress of technology



LECHT ON SCIENCE
Charles P. Lecht

We'd be hard pressed to consider the technological progress in the computer industry anything less than spectacular during the first half of the 1980s. Just about all the good things we wished for came true, including incredible increases — along with commensurate decreases — in systems power. As 1985 began, more than 50 million computer systems were on the desktops of Americans, and that just begins to reflect the progress. In 1980, many systems were considered so powerful that the U.S. government prohibited their sale abroad to all but America's closest allies. The recent emergence of desktop systems that integrate the power of computer technology with telephone, teletype and facsimile systems confirms that, in the first half of this decade, such progress has indeed been spectacular.

By comparison, the technological progress made by computer users in all industrial sectors appears dismally poor. The previously stable, if not perfect, computer technology that once serviced user needs has changed so fast that the manufacturer community seems to have forgotten the devastating effects this can have on its operations. Nothing is more upsetting to managers than the pressure to keep up with the competition caused by endless change in the tools they must use to do so. It's no wonder that many users secretly wish for the good old days when the life cycle of computer-based systems was at least five, and frequently, 10 years. And the life of the manufacturer that produced the hardware and software environments could be expected to last at least as long then.

In those good old days horrendous conversions were required when new systems were brought in. Today's data center managers tell me that, as the new, "almost" compatible gear flows into their facilities at ever faster rates, the rapid-fire — albeit less troublesome — conversions they face have not comprehensively lessened one bit the degree of trauma they previously faced.

Because of all the industry's technological progress, some computer facility managers I know have had to endure the embarrassment of awaiting the delivery of a newly procured system at the same time its vendor was announcing its replacement — calling the purchased system obsolete and discontinuing its manufacture. Faced with unanticipated decay in the residual values of the systems they bought, some managers have had to face the unhappy consequences of being the bearers of any bad news to management. And upon seeing its effect on assets, the management may have preferred to write down the career of the bearer instead of the value of the systems.

> *Users are doggedly trying to cope with a technology that, once contained in a single room, is now spread all over the place: a technology whose parts, made by international vendors, may defy connection.*

Yet other managers — pressured into buying the latest "cheapie" system from a company that, for a short period of time, lost its capability to distinguish between a toy and a computer — have been fired when the company from which they purchased the system retained its senses, discontinued its computer line and went back to making toys. The data center manager was charged with not being able to distinguish between a toy and a computer.

It would be hard to locate a user facility in which one or more of the above events or others of the same genre have not occurred during the first half of the '80s. In view of this, it is not surprising that some users — especially those who experienced the problems described above — think this period of accelerating technological progress has done nothing to make their computer systems chores easier. And it is also not surprising that users do not consider progress the computer industry's most important product.

Many users have hoped that such progress would summon the arrival of user-friendly, truly symbiotic systems so that the time they previously spent getting these systems to work might be reapplied to the affairs of their companies, but these hopes remain unfulfilled. Instead, they are doggedly trying to cope with a technology that, once contained in a single room, is now spread all over the place: a technology whose parts, made by international vendors, may defy connection, except by a bright young engineer who holds the key to the technology's continued operation.

If this view on the effects of galloping technological progress on the user community during the first part of the '80s seems pessimistic, I apologize and offer the following forecast to raise the spirits of those who must carry on. The second half of the '80s will bring far better days. As the grand plans of our industry leaders unfold, we cannot help but

See **LECHT** page 44

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

Fitting deadlines to resources cuts project failures



THE DATA CENTER
John P. Murray

The reasons for project failure in information processing are numerous. Some failures result from technical difficulties, some result from poor management. In some cases, the reasons for failure are valid, but in other cases they are simply excuses.

Project failure, to some degree, is in the eye of the beholder. A project that some organizations consider a failure may be considered at least a qualified success by another organization under identical circumstances. Let us consider the criteria for project failure as exceeding the original time and budget schedule and not delivering what was originally outlined in the specifications.

It can be argued that the preceding criteria are too rigid, given the oftensorry record of project completion in many organizations. Yet information processing projects can be successfully managed based upon such criteria. Projects can be consistently brought in on time, within budget and in accord with the specifications.

Murray is director of management information services for Rayovac Corp., Madison, Wis., and author of Management Information Systems as a Corporate Resource, *published by Dow Jones-Irwin.*

Arbitrary deadlines a problem

There is at least one all-too-common situation that almost guarantees project failure: the arbitrary imposition of project deadlines. It is not unusual to find the number of deadlines in an organization set in an arbitrary fashion. The above-specified project failure rate in these organizations is usually rather high. There is a correlation between the method used to set the deadline and the likelihood of project success.

Not only are those deadlines set arbitrarily, but often they are also set by someone who is not sufficiently knowledgeable in what to do to meet the deadline. For example, the vice-president of marketing meets the MIS director in the hall and says, "Oh, by the way, we will need support for our new marketing program that starts in three months. I guess I should have told you sooner, but it just slipped my mind. This should only be a minor system. It's not a real problem, is it?"

"We can handle that," the director replies, and then he approaches the systems and programming manager. "Marketing needs a new system, you better get someone to talk to them; they need it in three months," the director says.

Many of us are painfully familiar with the rest of the story. The new system is anything but minor. The new marketing program is indeed scheduled to begin in three months, but no one knows yet precisely what will be required. In fact, the plan for the new marketing program is now under revision, and until that is completed, no one can provide any concrete direction. Information processing goes into a wait state on the project, yet the meter continues to run toward the three-month completion date.

Deadline long lapsed

In time, the necessary detailed information about the system requirements are obtained, and the serious work begins. By now, of course, there is no way the original project deadline can be realized. The project, originally scheduled for completion in three months, is completed in seven or eight months. The marketing department is upset because the system took too long to complete, the information processing director is unhappy because the project exceeded the original schedule, and the project team is generally demoralized.

Project deadlines should never be arbitrarily imposed upon the project team. The project leaders must be given the time to analyze carefully what is required to complete the project, and they should set the deadline.

This does not mean the project leaders can set arbitrary deadlines any more than anyone else. The deadline should be achievable, based upon sound knowledge of the required results and must agree with those who use the system. This may require a general compromise to meet a reasonable deadline, but once set and agreed upon, the deadline should become fixed. Don't set the project deadline until you fully understand what is to be accomplished, whether or not you can do it and are certain of a reasonable degree of success.

'Crash' plan need develops

Of course, in some situations project needs are immediate, and a "crash" effort must be mounted. These instances should be rare in a well-managed organization. When they do arise, however, any deadline should be based on a "best guess," and appropriate senior management should be so informed. Sometimes, once clients understand that crash projects get immediate attention, a great number of such projects will be proposed. If information processing management accedes to these demands, many of its projects will end

See **FAIL** page 44

Software AG Users spell it out...Datapro™ survey rates ADABAS

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VIEWPOINT

System error messages, manuals need some cleanup

READER'S PLATFORM
Hutch Deloach

In the explosive evolution of information management, some of the simplest and most important aspects of the technology have been drastically ignored. This is particularly true in respect to the need for continued research and solutions for those long-term issues and problems that have gone unresolved. Such problems can be expected in a dynamic and changing environment but must not be allowed to continue and complicate future growth and development.

One example of such a problem is the "owner's mess," short for "unknown errors and messages." I would suggest that a vendor association be established to resolve once and for all the weaknesses and extreme diversities of error messages and manuals.

The following is a recommended list of questions that should be addressed by the association early in its existence:

■ Why must users face messages such as "an unexpected error has occurred"? Is the vendor trying to tell users that all other errors can be expected to occur on a regular basis? How many times must an unexpected error occur before the system begins to consider it an expected error?

■ Why is it that when a serious error occurs, the computer usually performs an automatic system reset followed minutes later by a local power failure so that there is no chance of debugging the problem?

■ When a message such as "Please notice that an error has occurred — error code = 111B" appears, why does the explanation of error codes in the manual skip from 111A to 111C?

■ Why are some of the error messages left out of the manual?

■ Why are error messages printed on the console when the error manual says to ignore them?

■ Why do we get error messages that say "error has occurred" only to find the explanation in the error manual says "self-explantory"?

■ Why does the manual instruct the user to ignore errors that lock up the entire system?

■ If I am a systems programmer, what do I do when I am having a problem and the error manual says "contact the systems programmer for more assistance"?

■ Why are error messages that say, "This program has been canceled due to program request" used? Few of us have ever written a program requesting itself to cancel before completion.

■ Why do most error manuals contain complex errors that never occur and could not be fixed by a programmer even if they did occur — for example, "temporary surge to transistor on circuit board 13-C"?

■ Why do most common problems not give error messages, and why do they eventually wind up bombing the system?

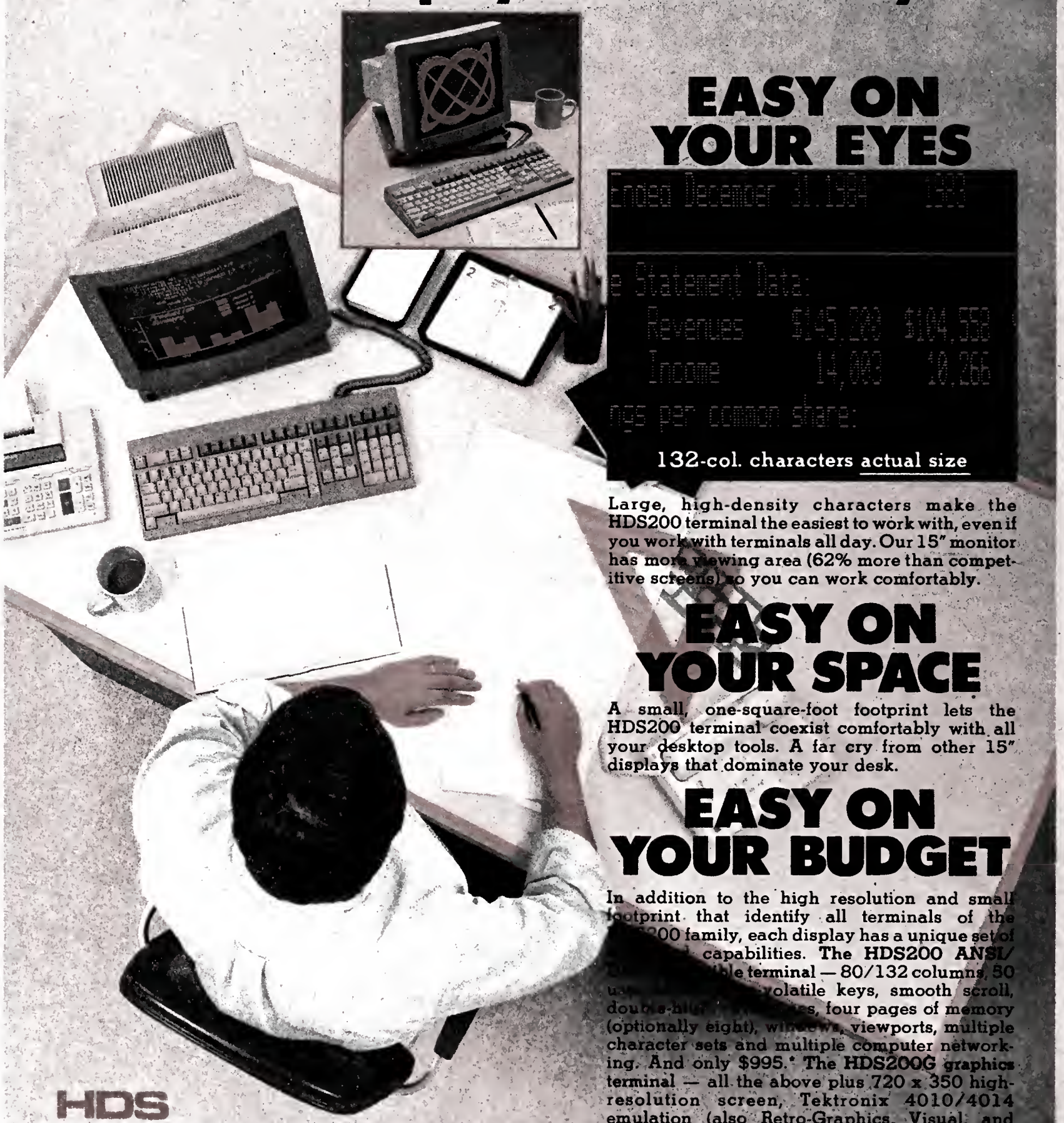
■ Why are some error manuals written as if the user had experience in designing operating systems? For example, "An improper value has been encountered by the extraneous logic detector inside one of the pseudorandom registers — please locate and correct the value in error and restart the program."

■ Why do vendors come up with noncommittal messages that do little more than keep nice people awake at night? For example, "An error has occurred; all data on the data base may have been destroyed." If such error messages must continue, it would be helpful to be told what chance exists that the data has survived. For exam-

See **ERRORS** page 44

Deloach is a systems programmer for the Georgia Ports Authority in Savannah, Ga.

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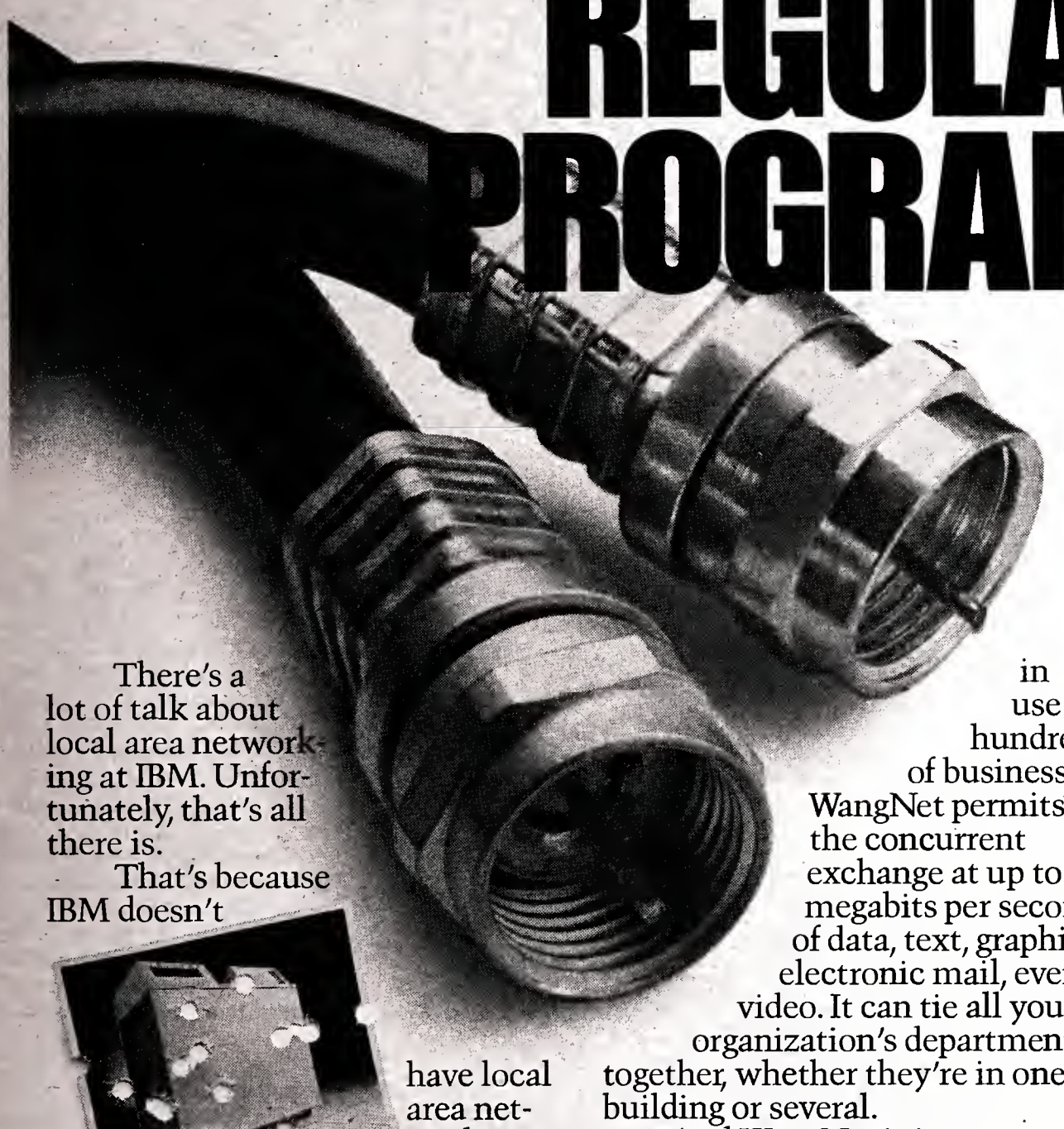
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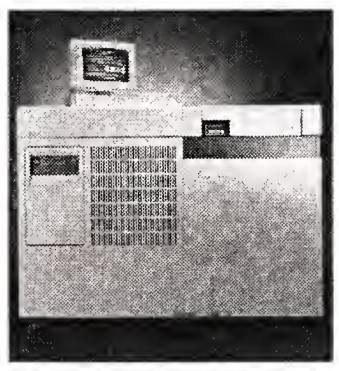
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Cache	Yes	No
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Removable Storage Options	Yes	No
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VIEWPOINT

LETTER from page 38

many involving millions.

■ Only 26% of the reported cases were detected by internal controls or routine audits.

These statistics reflect only detected and reported cases. Obviously, no statistics exist on the numbers or dollar value of losses for those cases that go undetected. However, it is a general consensus among law enforcement officials that such losses are in the billions. With losses of such magnitude, Kurth's "mounting sense of urgency" can be considered an understatement.

A few years ago, a small group of us in the computer security community attempted to establish a nonprofit organization to foster advanced research and disseminate information on ways and means of protecting information resources. We considered this proactive approach vital to any effort aimed at attacking the computer crime problem and related security issues. However, we were not able to generate the necessary interest or financial support within the business community.

Such an organization is needed today more than ever. However, the issues involved are too numerous and complex for any single association or professional society. Today, it is possible for the federal government to take the leadership position in establishing a council of public and private sector representatives to include, among others, those in computer science, security, communications, business, legal and social science.

Although such a council can be organized in many different ways, it is important that the problems involved be addressed from a broad interdisciplinary perspective across institutional lines.

Robert G. McKenzie
Alexandria, Va.

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LECHT from page 39

reach this conclusion.

At the heart of the plan of attack is the massive integrated services digital networks (ISDN), to which data processing devices will experience increasing connection. The evolutionary process during the earliest days of telephone systems will reveal itself as having been operative for some time, but its domain of operability, to our astonishment, will be discovered to exist in equal measure from chip to ISDN and everywhere in between. And the forces that created the ultimate standardization achieved in the telephone networks of the past will mount to do the same once again.

This will lead to an astounding technosynthesis that will end today's galloping technological progress in the computer industry by transferring it to the user community. I see victory for the user community at the end of the decade.

FAIL from page 39

up being classified as failures.

When the team is allowed to select a reasonable deadline for project completion, it has a responsibility to meet that deadline. Meeting the deadline should be understood to mean completion on time, within budget and in accord with the project specifications.

Information processing is a finite resource chased by infinite demand in many organizations, but it is simply impossible to be all things to all people. Those in charge of the function must determine project deadlines by moving from arbitrary imposition to considered practicality. This improves the success record of the installation, and the entire organization will be better served.

ERRORS from page 42

ple, "There is a 78% chance that all data on the data base has been destroyed."

For the sake of operators' and programmers' sanity, hardware and software vendors need to take a serious look at their technological priorities. It is very difficult to explain to your boss that "No error occurred" when the system crashed, or that the error has not been corrected because the error manual said, "Ignore it".

It is difficult to understand how problems like "unknown errors" can exist in a technology where program executions occur at a rate of billions of units per second. Perhaps vendors integrate unknown errors as a means of training for their technical support centers. ‡

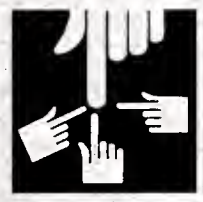
SOFTWARE & SERVICES

Micro-mainframe links cater to data downloads

By John Desmond
CW Staff

PHILADELPHIA — For some companies using micro-mainframe links here, data paths are a one-way street.

That was the consensus of three micro-mainframe link users who are employing communications software to download host data to micros but not allowing users to manipulate the information and update mainframe data bases.



The Computer Task Group, Inc. (CTG), a consulting group based in Buffalo, N.Y., called together information systems executives from several area companies for a discussion of data sharing via micro-mainframe links. According to Nancy Kuivila, end-user support manager for CTG, "There is a lot of talk about uploading and downloading, but many companies are just downloading reports. It is similar to reading a piece of paper rather than doing any real processing and then uploading to the data base."

Link users indicated that to manipulate production data on personal computers and subsequently upload it to the mainframe, they need micro-mainframe link software that is easy to use and that ensures data security. In addition, the purchases of such packages should be justified through cost-benefit analysis.

See **LINK** page 54

Links provide quick fix

But problems can arise from simple data link solutions, users told

By John Desmond
CW Staff

ANDOVER, Mass. — In lieu of a long-term strategic plan, DP and MIS managers with hordes of microcomputer users clamoring for links to the mainframe should provide a quick solution, visitors to a seminar on micro-mainframe links held here recently were advised.

But both the consultant and the micro-mainframe link vendor who offered that advice cautioned that such a "quick solution" approach often causes problems. Both were speakers at the seminar titled "Micro to Mainframe Links" sponsored by Software Institute of America, Inc.

Approximately 350 types of micro-mainframe links are currently available, said Kenneth Rau, a partner in the Winchester Consulting Group management consulting firm of Woburn, Mass. But during the 18-month period in which most of the links were introduced, the promise of the products has gone unfulfilled and user enthusiasm has faded to skepticism, he said.

Rau said terminal emulation and what he labeled file-loading-type links, allowing data downloading from a mainframe to a mi-

See **QUICK** page 58

HP enhances DBMS for 3000 supermini

PALO ALTO, Calif. — Hewlett-Packard Co. has announced an enhanced version of the HP Image/3000 data base management system for its HP 3000 superminicomputer. HP Turbo Image is said to offer improved storage capacity and data recovery in all HP 3000 series machines and improved performance for larger HP 3000 processors.

An HP spokesman said HP Turbo Image doubles the storage capacity of the HP Image/3000 data base and provides up to a 300% increase in the number of DBMS files and up to a 100% increase in the number of data items per set. The enhanced DBMS also increases maximum records in the data set from six million to two billion and increases maximum records in a data chain from 6,000 to two billion.

HP Turbo Image improves recovery time with a rollback recovery method and is fully compatible with all HP Image/3000 applications, according to the spokesman.

HP also announced HP Database Tools, performance

See **HP** page 58

Solo software shows falter

SOFTALK
John Gallant
CW Senior Editor

Can the software-specific trade show survive?

If you attended two of the recent software-specific trade shows held this year you will consider that a valid question. One can assume that most people consider the concept of a software-specific trade show a good one. But the way those shows actually turn out is often a different matter.

Consider the 1985 Softcon conference held in the fair city of Atlanta. It seemed to promise so much: a winning locale, a gala kick-off with ABC's Ted Koppel — reportedly for the tidy sum of $25,000 — chairing a panel of industry heavyweights musing on the future of software, an arm-long list of exhibitors and an agenda of sessions and workshops hosted by a bank of experts, pundits and seers.

What happened?

The show was a bore. Plain and simple. First, attendance was low. Unlike some of the claustrophobic cross-industry shows such as the National Computer Conference and Comdex, visitors could easily pass along the aisles between the booths on the Softcon conference floor. In fact, there was so little traffic at Softcon that it would have taken some real effort to bump into anyone on the floor.

And it was not just attendees

See **SHOWS** page 60

■ Informatics General announced enhancements to its Mark IV and Mark V IBM mainframe application tools/**47**

■ Performance measurement and charge-back software from Computer Associates International is now available for IBM VM/CMS users/**47**

■ Are relational products really data base management systems?/**48**

■ IBM unveiled the Information Development/VSE package for application development by DP professionals and end users/**50**

■ Applied Data Research announced Release 5.4 of its Roscoe program development system for MVS/**52**

■ Honeywell introduced an online conference system for its DPS 8, DPS 88 and DPS 90 processors/**52**

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Users can become acquainted with the facilities and power of the Information Center in the personal computing environment, and transfer their knowledge and skills as the MIS Information Center facility evolves. The ORACLE Personal Information Center provides the facilities for MIS to develop the cooperative relationship with end users so vital to the success of the Information Center.

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ORACLE is currently installed on over 1000 supermini and mainframe systems around the world, as well as on thousands of PCs and compatibles. Oracle's customers include 8 out of the 10 largest U.S. corporations, as well as major foreign companies and many government agencies.

For further information, contact Oracle Corp., Dept. C, 2710 Sand Hill Rd., Menlo Park, CA 94025, or call 415/854-7350 ext. 2043.

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Informatics General enhances applications tools

WOODLAND HILLS, Calif. — Informatics General Corp. has announced enhancements to its Mark IV and Mark V IBM mainframe applications development tools.

Enhancements to Release 10.0 of the Mark IV batch applications development tool include improved program documentation and error diagnosis, including cross-reference and execution-trace reports, a spokesman said.

Other added features include improved IBM DL/1 and Vsam support for file browsing and generic key functions and improved reporting capabilities such as changeable fonts for laser printers and overstriking.

Enhancements to Release 5.0 of the Mark V nonprocedural applications development system, for developing on-line applications under IBM's IMS/DC and CICS, include IBM Fast Path data base support for IMS/DC and improved screen design capabilities including 3270 extended attribute support.

Improved processing capabilities reportedly include simplified date and numeric field validation, flexible selection and branching and diagnostic messages.

Release 5.0 of Mark V also provides enhanced debugging aids such as troubleshooting screens, CICS command-level program generation and run-time file definitions.

Mark IV Release 10.0 is priced at $78,000 and $98,000, respectively, for the DOS and OS versions. Mark V Release 5.0 is scheduled for delivery in the second quarter and is priced at $36,000 for the DOS/CICS version, $45,000 for the OS/CICS version and $100,000 for the OS IMS/DC versions.

Informatics General is located at 21031 Ventura Blvd., Woodland Hills, Calif. 91364.

CAI extends its CA-Jars for VM/CMS

JERICHO, N.Y. — Computer Associates International, Inc. (CAI) has extended its CA-Jars performance measurement and charge-back software to IBM VM/CMS users with CA-Jars/CMS. The company also announced Release 5.0 of CA-Jars/CICS, an on-line job accounting tool for IBM DOS/VSE and OS/MVS users.

CA-Jars/CMS includes five components: project accounting, interval resource logging, product accounting, a historical data base and a report writer, the vendor said.

The project accounting component reportedly allows the VM/CMS user to assign any portion of a CMS session to a specific project and charge individual projects for the resources consumed.

The interval resource logging feature allows the VM/CMS user to capture resource consumption data at specified intervals for managing peak load periods.

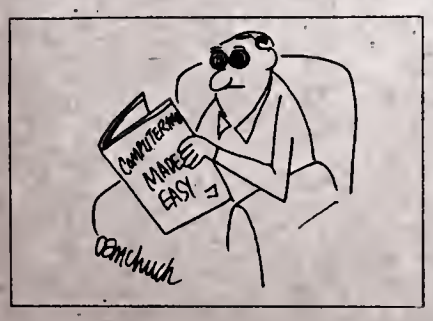
Product accounting allows CA-Jars/CMS users to track software products for cost distribution.

A permanent license for CA-Jars/CMS is priced at $15,000.

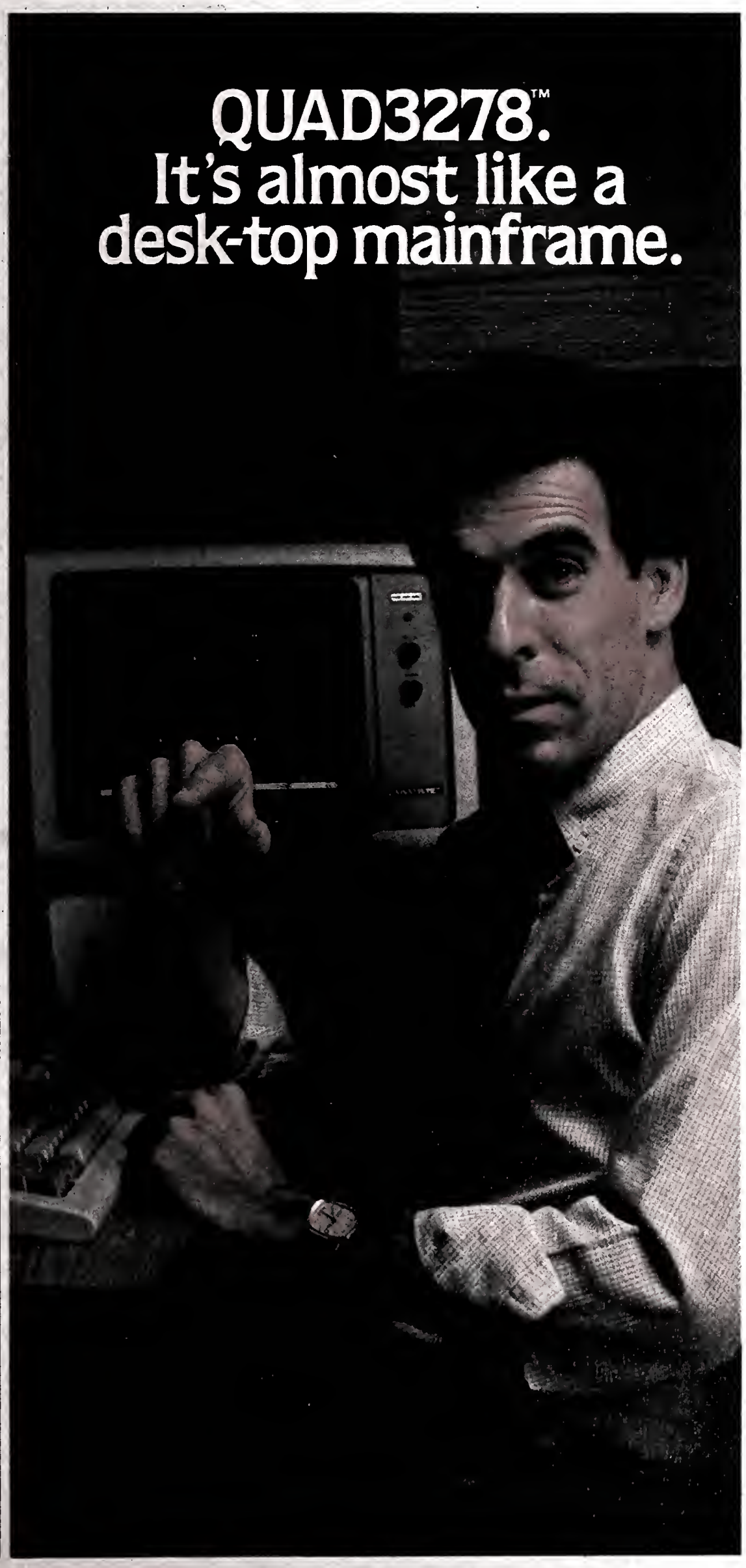
Enhancements to Release 5.0 of CA-Jars/CICS include response time degradation analysis for trouble-shooting an on-line network, menu-driven graphics, on-line displays, report language and the company's Wizard graphics report generator.

Release 5.0 supports IBM's CICS 1.6 and 1.6.1. A perpetual license for CA-Jars/CICS is priced at $10,500 for DOS/VSE and $14,250 for MVS.

CAI, 125 Jericho Tnpk., Jericho, N.Y. 11753.



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Relational products failing to meet basic DBMS criteria

SOFTLINE
Bob Morison

When is a relational product not a data base management system? The answer, unfortunately, is most of the time. In their rush to market products that qualify as relational, vendors are delivering products that fail to qualify as DBMS in the first place. This is true of even the flagship relational offerings of some major hardware and software vendors.

Meanwhile, encouraged by data base theorists and by a marketing blitz, users are catching relational fever. Unless they select products carefully, they risk trying to build information systems on relational products that simply do not meet their needs.

Of the three most common models for data base systems — hierarchical, network and relational — relational offers the greatest flexibility in data access. Relational products have the powerful capability to relate records by matching data values without regard to defined data relationships or data base paths. In so doing, however, they often forfeit the essential ability to relate records with regard to defined relationships. The latter is the essence of a DBMS.

By accepted definition, a DBMS models and manages not only an organization's raw data but also the relationships among that data. In fact, the relationships themselves are an essential part of an organization's data. A DBMS must support defined relationships between logical data types and enforce them automatically. In a true DBMS, for example, you can tell the system that purchase orders are associated with vendors and the system will put that knowledge to work for you.

Sophisticated file managers

Products that fail to support defined relationships may qualify as sophisticated data or file managers, but they are not DBMS. Moreover, they probably disqualify themselves from use in complex, integrated applications — such as accounting, manufacturing planning and control and order service — where data types are many and logical relationships must be enforced. Without a true DBMS, you can model a business' raw data, but you cannot fully and accurately model the business itself.

This lack of support for defined data relationships underlies many of the fundamental problems besetting relational products today. Most relational products fail to support the essential function called referential integrity. Referential integrity dictates, for example, that a purchase order may not be written for a nonexistent vendor. Conversely, a vendor may not be removed from the data base if purchase orders are assigned to it.

If this logical relationship between vendors and orders is not defined, the system cannot enforce it. Instead, programmers must be aware of the implied relationship and write applications code to enforce it.

The more complex the application's logical data relationships are, then the greater the exposure to data inconsistencies when programmers fail to enforce logical relationships.

The most commonly cited drawback of relational products is their inefficiency in production environments, especially in terms of I/O. A partial remedy is to use the knowledge of defined data relationships to reduce I/O.

For example, a purchase order is logically associated with a single vendor. Having

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Morison is manager of technical consulting at Mims Systems, General Electric Information Services Co., in Burlington, Mass. Mims is a hybrid network/relational DBMS and nonprocedural programming language.

Getting a group of five or six personal computers networked isn't that big a deal. But it gets complicated when the group gets bigger. And in case you hadn't noticed, the groups are getting bigger. Fast.

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accessed an order record, the DBMS should be able to access the associated vendor record with no more than one additional I/O action. This can be done via an embedded pointer in the order record containing the exact address of the associated vendor record.

But most relational implementations do not employ interrecord address pointers. They do support forms of indexing, so, at best, locating a logical owner record requires an index search. At worst, if the necessary index is missing, it requires a data file search.

Inability to update views

Another drawback of relational products is the frequent inability to update views. A view is a virtual table, or file, containing selected records and fields from one or more base data tables. A view may represent data about open purchase orders and selected data about vendors and line items.

Most relational products support multitable view for reporting but not for updating. Because the logical relationships among data types are not defined and enforced, the system cannot automatically decompose — or sort out — an updated view into appropriate updates to the underlying records.

Therefore, relational products usually impose the restriction that a view to be updated must be a subset of a single data table. But disallowing updates to complex views forfeits much of the advantage of the relational approach. A multitable update requires a multistep program, a procedure reminiscent of the data base pathing that relational proponents abjure.

In practice, many views are logically updatable — if data relationships themselves are defined. The DBMS should be able to use defined relationships to decompose views. It should then perform the appropriate updates or else warn the user if the resulting updates would be ambiguous or contradictory.

Complex data structures

Relational products also have difficulty handling certain complex data structures, notably recursive relationships in which a file is related or cross-referenced to itself. For example, financial accounts related to other accounts form a chart of accounts; parts related to parts form a bill of materials.

Representing bills of materials normally involves two logical data tables, a master parts table and a product structure table. Each record in the product structure table is logically related to two records, one assembly part and one component part, in the parts table.

Modeling this dual relationship can provide essential functionality currently missing from many relational products. A robust DBMS handles operations such as parts explosions efficiently. Its programming language includes concise, nonprocedural commands to do both reports and updates. And it supports low-level code integrity, whereby the software prevents, for example, product structure loops.

By failing to admit this type of defined relationship and to support even simple explode actions, many relational products disqualify themselves from production applications that rely heavily on recursive data structures.

Convenience, confusion

Why do most relational products fail to provide basic DBMS functionality? There seem to be two related causes: convenience and confusion.

The relational model calls for data represented to the user as simple tables. The most convenient implementation of the model is to restrict physical data structures to stored data tables, one per record type, and their indexes. In the rush to market relational products, vendors have avoided the more complex but more functional internal architectures associated with network and hierarchical systems.

Theoretically, relationships could still be maintained dynamically, but with extra I/O, by these relational systems. However, most vendors have not developed the sophisticated software to do so.

The confusion is over the exact meaning of relational. The word refers to a model of data for the user and to a language based on that model. The logical model itself

See **DBMS** page 60



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IBM unveils tool for applications development on VSE

RYE BROOK, N.Y. — To complement its recently unveiled Version 2.1.1 of DOS/VSE/SP [CW, April 8], IBM has announced Information Development/VSE 1.1 (ID/VSE 1.1), aimed at improving the productivity of application developers who use VSE.

At the same time, IBM announced Interactive Composition and Editing Facility Version 2 software for composing documents containing text, computer-generated graphics and scanned images.

The program can be executed from the IBM 3270/3290 display terminals with graphics capability under the VM/CMS Release 2 operating system.

Four programs

According to a spokesman, ID/VSE 1.1 is an applications package composed of four programs. The package runs on processors that support VSE/SP 2.1 or SSX/VSE Release 4.

Features of ID/VSE 1.1 reportedly include applications development functions in a CICS/VS environment, query support for Vsam files and support of data transfers from the host to the operating system's host transfer file for further processing at intelligent workstations. The package is also said to expand VSE/SP and SSX/VSE Intelligent Workstation Support (IWS).

The ID/VSE's productivity facility program provides menu panels to help users select and move between programs. Movement of data to the IWS transfer file is aided by menus, from which tasks can be selected.

Other programs in the information development package provide functions for generating and executing applications, setting up queries on VSE/Vsam files and supporting graphics applications.

Interactive interface

Cross System Product/Application Development (CSP/AD) Version 1 provides an interactive interface for defining, testing, maintaining and generating application programs. The product is said to allow users with limited data processing skills to define and generate applications via question-and-answer techniques. CSP/AD Version 2 adds support for DL/1 data bases and large terminal networks.

CSP/Application Execution provides the ability to execute any application defined and generated via CSP/AD.

CSP/Query is a query language product that permits selection, display or printing of data from Vsam files.

The Graphical Data Display Manager (GDDM) program and its Presentation Graphics Feature provide graphics drawing, display and printing capabilities that coexist with current applications.

Reformatting data

In another feature, ID/VSE provides utilities that reformat CSP Vsam data prior to moving it to the operating system's IWS transfer file. From the IWS transfer file, the data can be transmitted to workstations. Users can select from two data reformat options: that used on the IBM Personal Computer with Basic and Software Arts, Inc. Data Interchange Format structure.

ID/VSE Productivity Facility is available for a one-time charge of $1,800 for a basic license or $1,620 for the distributed system license option. The one-time charge for GDDM is $715.

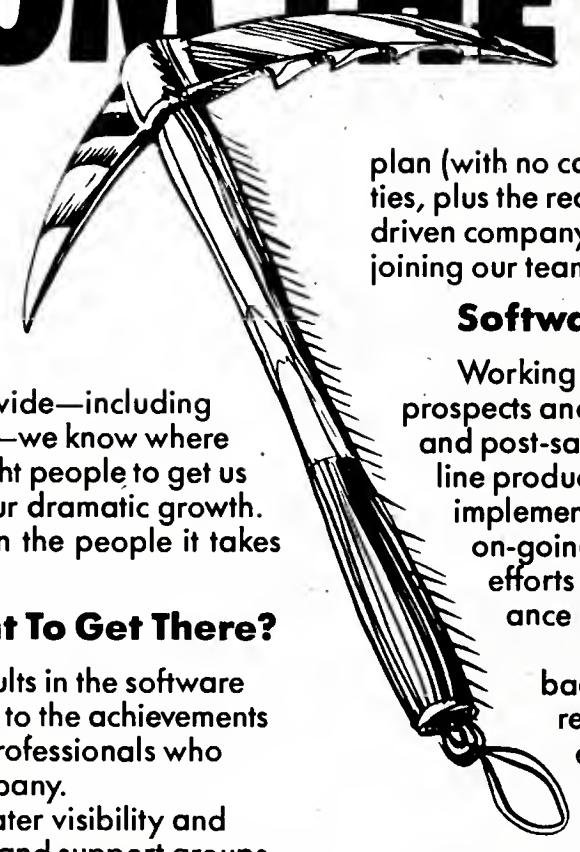
Features of the Interactive Composition and Editing Facility Version 2 include the ability to create tables and bibliographies and to embed graphics and images in documents.

The product also includes a processor for viewing and printing mathematical formulas and a dual-screen mode that allows the user to edit a document on one screen and view the formatted result on another. The one-time charge for Interactive Composition and Editing Facility Version 2 is $25,000.

Further information is available from IBM at 900 King St., Rye Brook, N.Y. 10573.

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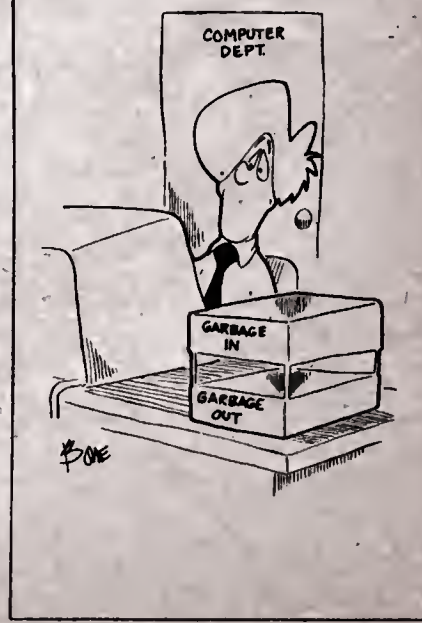
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SOFTWARE & SERVICES

Honeywell launches Forum 8 Interactive Meeting System

PHOENIX — Honeywell, Inc. has announced the Forum 8 Interactive Meeting System, an on-line conference system for the company's DPS 8, DPS 88 and DPS 90 processors running the Gcos 8 operating system.

Honeywell also announced the Solution Center Menu System for the integration of the company's Solution Center software with the Gcos 8 Time-Sharing System, also running on Honeywell processors.

The Forum 8 software allows Gcos 8 users to conduct an electronic conference. Forum 8 maintains, sequences and controls access to conference transactions, a spokesman said. Users can participate through dial-up connections. Forum 8, to be available in the second quarter, costs $180 per month for a one-year minimum agreement.

The Solution Center Menu System allows end users to pass data between Solution Center products and corporate data bases, a spokesman said. The software displays a hierarchy of menu screens listing user options. Selections are translated into system commands. The product is available for $200 per month for a minimum of 12 months.

Honeywell, P.O. Box 8000/A-79, Phoenix, Ariz. 85066.

Bytel menu-driven tool allows for generation of Cobol queries

BERKELEY, Calif. — Bytel Corp. has announced Quepro, a menu-driven program that allows users to generate their own Cobol queries and reports. Quepro runs under IBM's PC-DOS, Microsoft Corp.'s MS-DOS, AT&T's Unix System III, V and VII and NCR Corp.'s Imos, IRX and ITX.

Features of Quepro include a query system that allows users to select items by positioning report and data element titles on a screen, or by placing the report in an 80- or 132-column format for printing. The list format can be used to examine a group of records that share common criteria, such as invoices of the same date.

Both report formats allow calculations of data elements including addition, subtraction, division, multiplication and ratio percentages. The list method can sort records in ascending or descending order and provide totals on numeric fields. Before users can use Quepro to design queries and reports, a programmer must use the product's customizer to establish the link between data files and the runtime processor.

Quepro is available at the following prices: $595 for the microcomputer version; $785 for the Microsoft Xenix and AT&T's Unix System III versions; $2,285 for the Unix System V and OSM Computer Corp. Zeus versions; $3,150 for the NCR Imos, IRX and ITX versions; and $9,500 for systems running Unix System VII.

Bytel is located at 1029-D Solano Ave., Berkeley, Calif. 94706.

ADR enhances Roscoe release for IBM's MVS

PRINCETON, N.J. — Applied Data Research, Inc. (ADR) has announced an enhanced release of its Roscoe on-line program development system for IBM's MVS operating system.

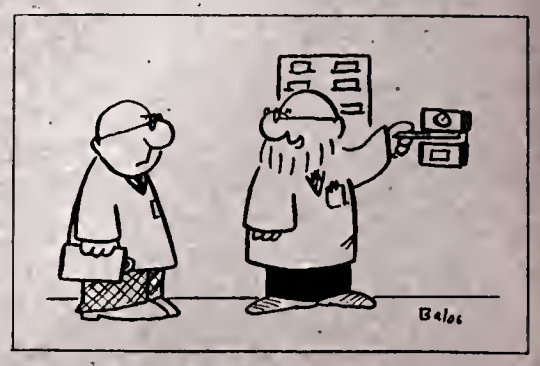
Roscoe 5.4 now includes a transaction response/resource monitoring subsystem, a system spool browse facility, a screen painter for IBM IMS/DC applications and an interactive Roscoe Programming Facility training tutorial, a spokesman said.

The response time monitor now allows resource use and response times to be collected by transaction for the entire system. On-line displays report the information for the whole system or selected users. The system spool browse facility extends the single-mode environment.

Roscoe's screen painting facility, called Sketch, which previously supported CICS, now supports Message Formatting Services of IMS/DC. The Sketch user is prompted to paint full screen panels and to define fields. Sketch can be integrated with ADR's DL applications development system for IMS/DB/DC, ADR's Datacom/DB and CICS applications, according to the spokesman.

Roscoe 5.4 is available on IBM mainframes and plug compatibles running under OS/MVS and MVS/XA. Roscoe is licensed for $60,400.

ADR is located at Rt. 206 and Orchard Road, CN-8, Princeton, N.J. 08540.



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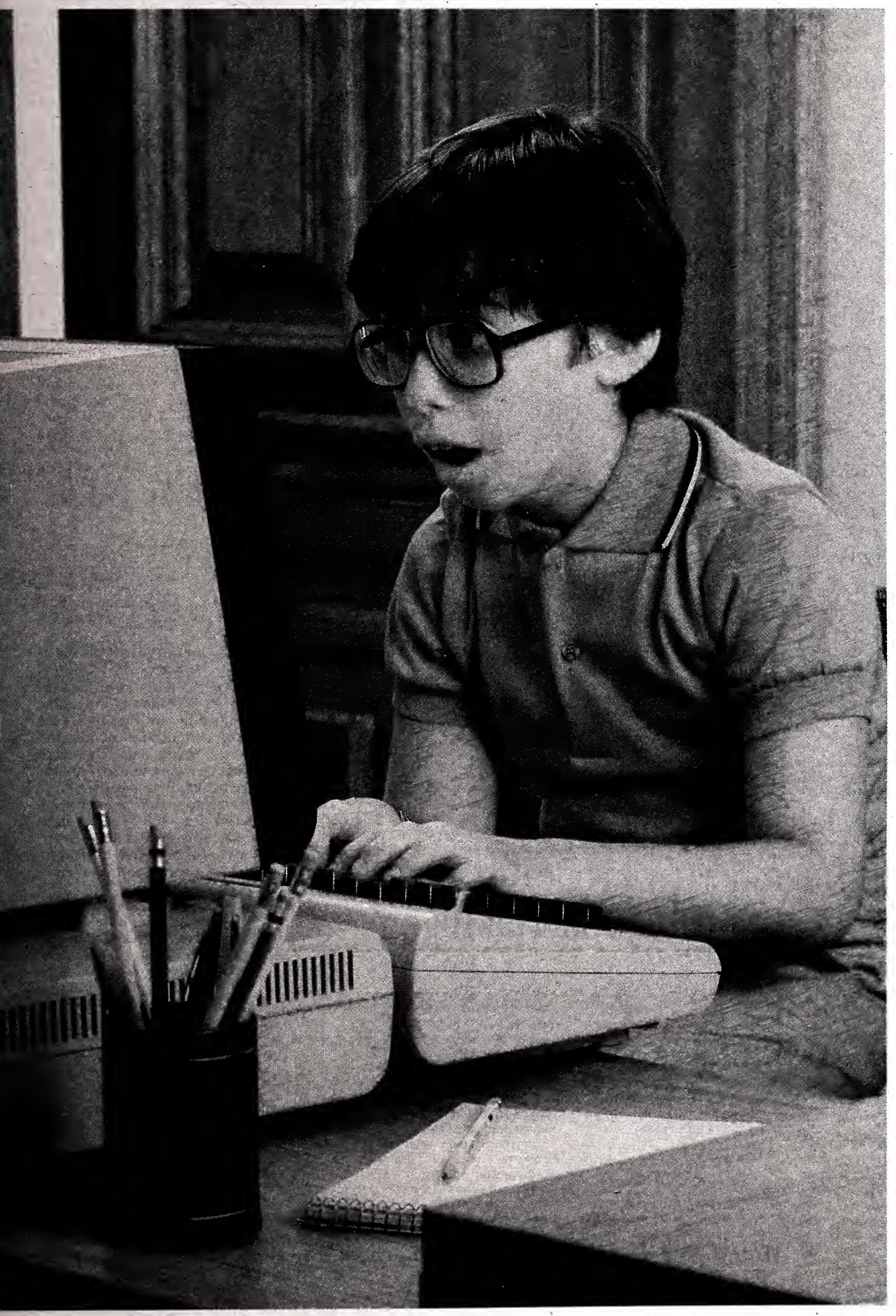
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For more information on VMCENTER, call or write VM Software, Inc., 2070 Chain Bridge Road, Suite 355, Vienna, Virginia 22180, telephone **(703) 821-6886.**

VM SOFTWARE INC.

1-CWX-0485

LINK from page 45

The nature of micro-mainframe link use cited by the users was consistent with a recent survey of 155 computer sites conducted by International Data Corp. (IDC), a Framingham, Mass.-based market research firm. IDC found that 38% of the respondents were using some type of micro-mainframe communications software.

Of those, 29% — the largest group — allowed read-only access and data downloading only, while 7% permitted only read-only access via terminal emulation [CW, March 18].

According to Gerry Schloss, manager of financial systems and of the information center at FMC Corp. here, FMC currently has no need to upload data from its local micros to corporate data center mainframes in Dallas. FMC uses IBM 3270 terminals and some IBM Personal Computers, ATs and XTs to communicate with its IBM 3080 series mainframes via dial-up lines.

Ramis II data converted

Portions of FMC's IBM IMS data base authorized for viewing by end users are copied into a Ramis II data base from Mathematica Products Group, Inc. The Ramis II data is then converted to Ascii files for downloading to the personal computers by Software Corp. of America's Gateway. Microrim, Inc.'s R-Base 4000 data base manager and Clout simplify end-user access to the data base. Clout allows nontechnical users to formulate inquiries to the data base using English language commands, according to Tim Postlewaite, systems engineer at FMC.



In a typical application, sales representatives may want to gauge the effect on customers and regional sales of eliminating a certain product. They can get the required data from the mainframe using Gateway, load it into a Lotus Development Corp. 1-2-3 spreadsheet and manipulate the data to answer questions.

FMC currently does not allow data uploading. When FMC first looked for software to facilitate uploading from micros to the mainframe, the company could not find a product that accommodated both its dial-up and coaxial cable access methods.

But, according to Postlewaite, "the industry is so new that things are changing daily." Thus the company is now reviewing Pansophic Systems, Inc.'s Panlink micro-mainframe link in hopes of providing uploading capabilities.

Ensure data security

Before permitting uploading to the mainframe, however, FMC must also ensure data security. "We can't have people going into live files and making changes at will," Schloss said. The company currently limits end-user download access to data relating to an individual's job area.

Arco Chemical Co.'s data center here has an IBM 3081 Model K running MVS/XA and a 3033 Model N running VM/CMS communicating via IBM's Systems Network Architecture over coaxial cable to IBM 3270 Personal Computers. The company has nearly 100 microcomputers in three main locations nationwide, according to Carl Weber, manager of Arco's information center. Arco uses Information Builders, Inc.'s Focus and PC/Focus fourth-generation languages to provide end-user access to mainframe data.

Like FMC, Arco is using its micro-mainframe links only for data downloading due to "concerns with control of the application being uploaded." Specifically, Arco is concerned about identifying where the uploaded data originated, according to Weber. He has not yet found a product that can identify the origin of transactions sent to the mainframe IMS data base from a micro.

Present system limitations

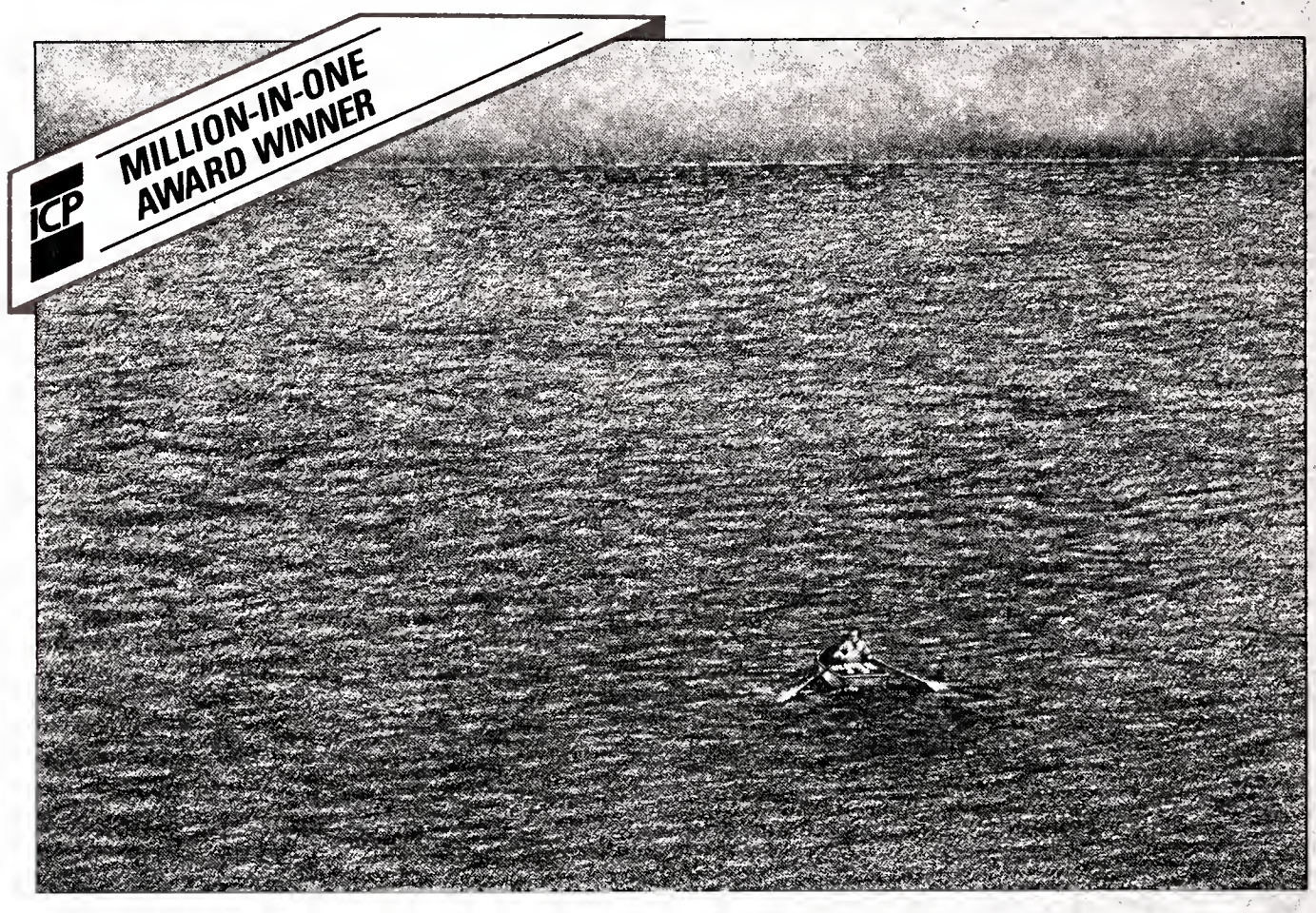
In the absence of such a product, Weber said he would be forced to modify existing mainframe applications to provide for the identification of data origin.

For new applications, Weber is considering Informatics General Corp.'s Answer/DB end-user data retrieval tool as a method of uploading and downloading to the IMS data base. Citing a limitation of his present system, Weber said, "I would like to see it be easier to use than it is for the casual or first-time user."

A cautious approach to microcomputer-mainframe links has been adopted at Philadelphia Life Insurance Co., where only three microcomputers in the information center are linked to the company's IBM 3083 mainframe. Philadelphia Life uses some 60 micros on a stand-alone basis. According to Tom Peterson, information center analyst, the restriction on the number of links "is a method of determining what training is required, the impact on the rest of the 3270 network and what reliability issues arise."

Philadelphia Life's link allows users only to download reports from the mainframe to the micros in the information center. Data is moved into Lotus' 1-2-3 spreadsheets and graphics packages for analysis. Peterson described the downloaded reports as "another kind of paper." The system is limited to small file transfers of under 100K bytes, Peterson said. Before uploading from the micros is allowed, he said, the company must develop a security system that limits users to accessing only their own files.

Philadelphia Life currently has no plans to link all its micros to the mainframe, but link availability is considered on an individual basis. "We're not trying to push hardware; we're trying to answer business needs," Peterson said.



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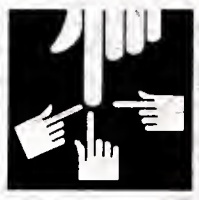
QUICK from page 45

cro, are available now and can be implemented quickly. In addition, file transformation links that translate data on the mainframe into the format required for use with micro software products such as a spreadsheet are also available — though they may take more time to implement. However, links that facilitate real information exchange, or data downloading for processing and uploading to a variety of hardware environments, are only beginning to be developed, Rau said.

Larry R. DeBoever, president of Linkware Corp. of Waltham, Mass., a vendor of the Linkware package for linking IBM and Digital Equipment Corp. micros to larger IBM or DEC systems, seconded Rau's advice. "It is sound to get users off your back while you think about a strategic solution," he said.

Issues to be addressed when considering a quick solution include performance, data transformation and implications of end-user access to production data.

"The single biggest disappointment for a personal computer user [using a link] is the performance aspects of file transfer," DeBoever said. "The user evaluates the file transfer by how fast the screen comes back."



In the IBM world, he said, performance is limited by the 19.2K bit/sec. maximum bandwidth of the IBM 3274 controller used to link terminal-emulating micros to the mainframe. "You [have to] splice up that 19.2K [bit/sec.] bandwidth and share it with other users," he said.

He contrasted that performance with links to DEC VAX processors, which allow for 19.2K bit/sec. channel speed per terminal instead of per controller. "DEC [machines] will be faster [than IBM's], but they will not [deliver] the kind of performance that users expect," DeBoever said.

The data transformation issue arises when micros appear to the mainframe as an IBM 3270 device. "The IBM world is designed for screen transfer and not file transfer. The IBM world is completely ill-equipped to deal with the idea of moving files through a network. So the vendor makes a screen look like files, and some funny things happen when you do that," DeBoever said.

Boards providing 3270 emulation are often plugged into the micro to allow for the mainframe link. But because the boards often cost from $800 to $1,000 per micro, some shops use one protocol converter to provide the same capabilities for as many as three micros. Shops that use protocol converters in this way often run into problems, such as data misinterpretation that results in changed or lost files. The converters can also adversely affect performance.

Links allowing end users access to mainframe data are most successful when host data resides on a single processor in a single data base, DeBoever said. Those links are successful because data location is transparent to the end users, the issue of accessing different hardware types is avoided and data security is easier to ensure, he said.

DeBoever advised managers who are testing micro-mainframe link products to require the vendor to move company data and files, not canned data, through the link in a prepared demonstration. He also recommended the following: asking the vendor to transfer a greater number of characters than allowed by the link to see what impact it has; timing transfer execution; checking file size after the transfer if the data is moved through a protocol converter; and testing an emulation board in a micro before buying.

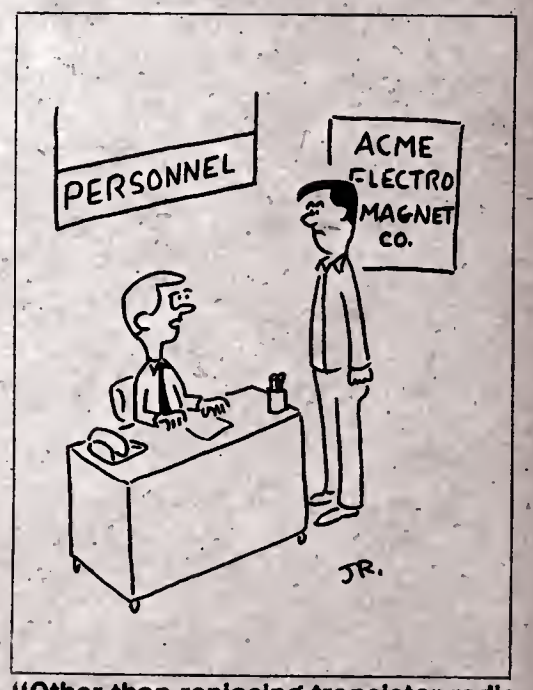
HP from page 45

analysis software designed for use with HP Turbo Image. The products reportedly provide performance and usage statistics to help determine the optimal Turbo Image data base and applications design.

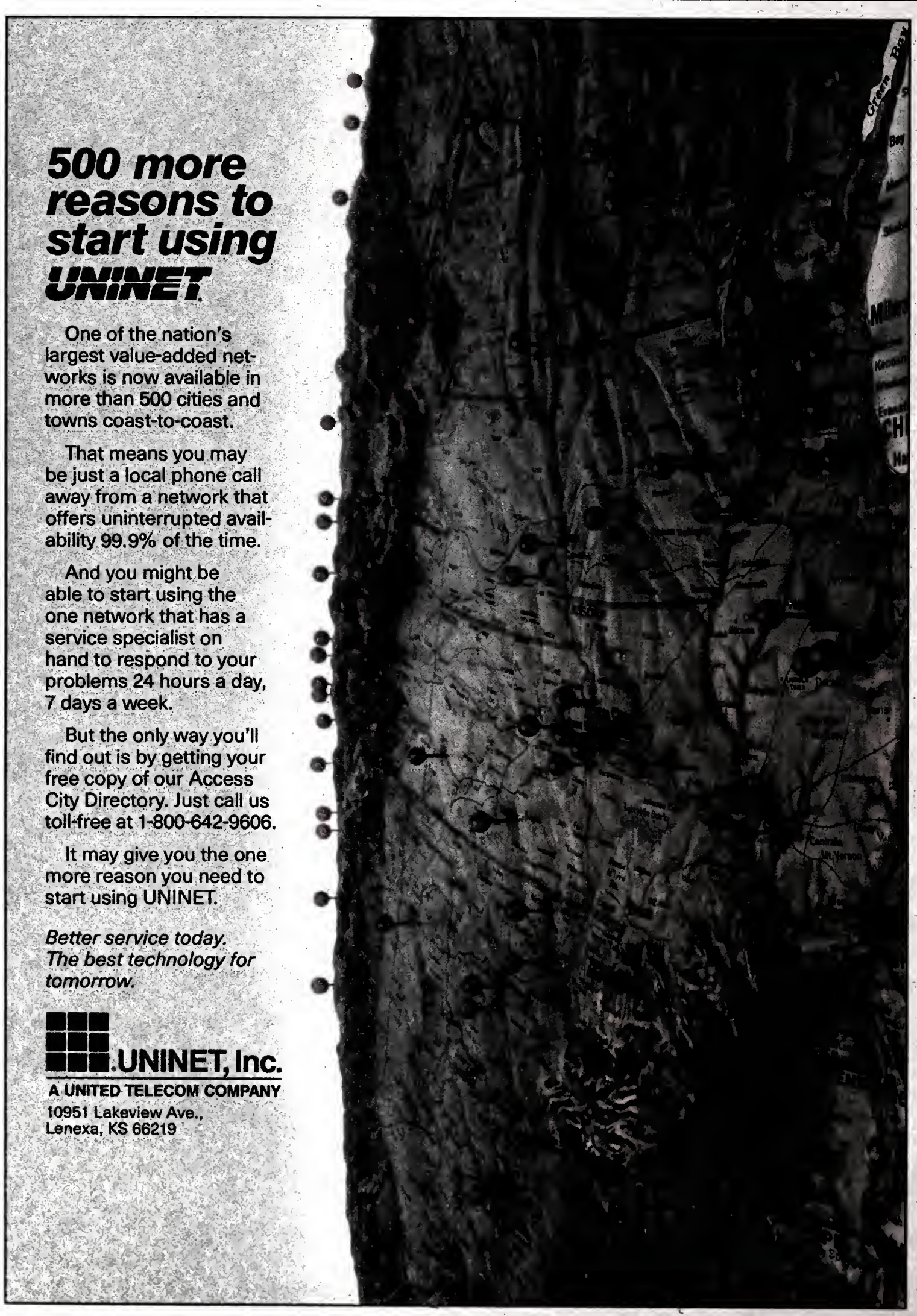
The HP Turbo Image Profiler tool is said to gather data while applications are running and provide a range of statistics reports on request: reports on system resources used by each data base request in an application, reports on which programs demand too much of the system's resources, reports on the most efficient way to structure relationships among files in a data base, reports on minimizing I/O operations during data base processing and reports on time programs put on hold while information is being updated.

HP Turbo Image will be distributed free to current HP 3000 users and will be part of the fundamental operating software of HP 3000s. HP Database Tools is priced at $3,500 for a perpetual license.

HP is located at 3000 Hanover St., Palo Alto, Calif. 94304.



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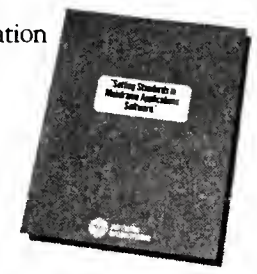
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SHOWS from page 45

who decided to skip the show. Softcon literature listed nearly 20 vendors that canceled out of the show. With just a quick walk around the floor of the Georgia World Congress Center, one could see at least 25 vacant booths with only chairs for the weary visitor. Some of those booths were good-size chunks of prime floor space — sans vendor.

A Wang Laboratories, Inc. representative at the show was overheard saying that the Lowell, Mass., company had committed several thousand dollars to obtaining floor space before deciding to pull out. Wang's Booth 1917 was empty, although the vendor was listed in the conference guide. Apple Computer, Inc. was also listed as an exhibitor, but instead of erecting its usual snazzy booth, the Cupertino, Calif., microcomputer giant held only a room off an upper floor for "third-party demonstrations and meetings for those interested in software development for the Apple IIe or IIc, XL and Macintosh."

> *The show was a bore. Plain and simple.*

In addition to the vacant booths, visitors also had to deal with vendors whose relationship to the software world was questionable at best. Among them was an orthopedic products vendor — complete with cross-sectional models of the human foot — who offered limb-weary visitors a free footprint analysis.

The remainder of the booths — those erected by *real* software companies — resembled a bus station for marketing representatives. So many people were just standing around. Booth attendants gathered in small groups chatting among themselves; one woman even knitted in between passersby. Vendor representatives confided that they were disappointed with the turnout, especially those with the few mainframe software companies that chose to attend. The mainframe vendors were hard-pressed to locate their target buyers — the MIS and DP managers — who were noticeably absent from the primarily micro software show.

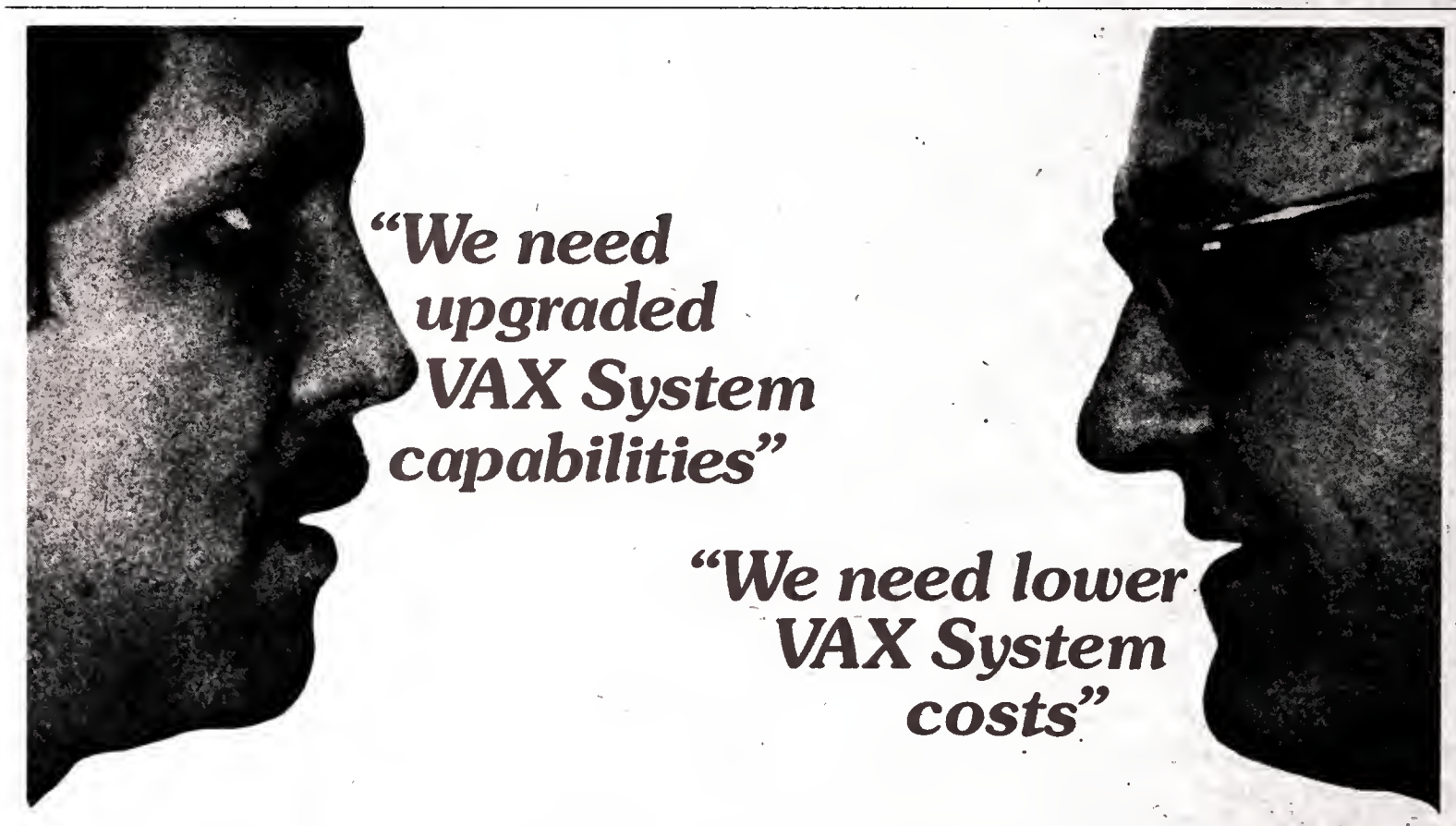
What of the sessions? It is hard to criticize the speakers who gave their time to expound upon the topics Softcon planners covered. But it is about time speakers divorced themselves from their company's products and services and objectively discussed the topics at hand. One very high-level executive of a leading software company apologized for using slides with his company's product logo emblazoned all over them, yet his presentation could easily have been given without the self-promoting visual aids. Several other speakers pawned off their marketing pitches by explaining that they were only using their products "as an example of one way to approach a problem."

Same problems for other shows

This is not to single out Softcon. The recent Info/Software conference exhibited many of the same problems. In fact, the same company president used the same slides to give the same presentation at Info/Software. As at Softcon, no major products were unveiled at Info/Software, and attendance was low. A superb session on software maintenance was attended by seven — count 'em, seven — people, and an excellent presentation on prototyping boasted only a handful more listeners.

All this means that you, the potential conference visitor, must be cautious in deciding just where to allocate your limited show time. Review that agenda. Do you really need to hear Ted Koppel make disparaging remarks about computers and software vendors? Will it help you to go to yet another session on strategic planning and hear yet another vendor make another product pitch under the guise of a technology overview? Are the companies on the conference list really the vendors of products that interest you?

Some aspects of the trade show circuit will likely be restructured in light of how recent software-specific shows have fared. Some consolidation and some trimming of fat are in order. It is time for you — the audience — to tread carefully.



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DBMS from page 49

implies no stipulations regarding physical implementation. Thus, behind the model can be whatever implementation works best.

Builders of relational products have tended to blur the distinction between logical and physical designs and they have mistakenly rejected techniques proven useful in network and hierarchical DBMS.

To work as a true DBMS, a relational product should be able to model all common data relationships. It must allow definition of data relationships and utilize these definitions to support referential integrity. It should also use relationship data to promote I/O efficiency.

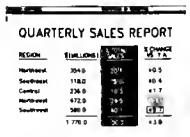
Builders of relational products must break out of their 'newer is better' and 'different is better' syndromes. They should implement the relational model in conjunction with whatever physical structure offers greatest functionality and efficiency. They should embrace those elements of network and hierarchical models that can make their products full and production-worthy DBMS.

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IN DEPTH



Part two

Power from the products

By Pieter Mimno

Fourth-generation language tools offer both end users and DP professionals major gains in productivity and ease of use. However, there is a great deal of confusion about how to select those tools and use them effectively within a specific computing environment. The competing claims of vendors make it difficult for prospective buyers to sort out the advantages and disadvantages of specific products. In addition, there is uncertainty about how to manage these new tools within a distributed, end-user-driven environment.

Business executives are becoming increasingly frustrated with traditional information systems departments. DP is often chronically late in delivering application programs, and when they are delivered, the applications frequently do not match the end user's needs. It may take weeks to get urgently needed information from the data base to solve immediate business problems.

Business professionals are aware that alternatives to the traditional DP process are now available. End users have become excited by the potential of high-productivity tools such as 1-2-3 from Lotus Development Corp., Focus from Information Builders, Inc., Express from Management Decision Systems, Inc. and others. However, many potential buyers of these tools are confused by the competing claims of vendors and are unable to evaluate which tool would best suit their specific requirements.

Many information systems departments are equally frustrated and

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The first part of this series [CW, April 8] summarized recent developments in fourth-generation languages.

unhappy. Often the department head has constant confrontations with end users and is aware that they are attempting to bypass DP by purchasing personal computers and fourth-generation language tools. The department frequently attempts to react to this situation by providing advice on selecting personal computer hardware and by answering questions on the use of personal computer tools such as 1-2-3. However, many information systems department heads are deeply worried about the consequences of losing control over the proliferation of end-user computing capability.

This discussion focuses on three specific areas:

Overall strategy for end-user computing. What are the business goals, needs and information processing requirements that are to be met through the use of new, high-productivity tools? What overall end-user computing strategies will best meet these needs?

Hardware/software strategy. What categories of hardware and software tools best achieve the goals of the end-user computing strategy?

Tool selection. What are the most important issues that drive the tool selection process? What specific tools should be recommended?

End-user computing

Prior to selecting fourth-generation language tools, it is important to develop a clear strategy for end-user computing. A common mistake is to place a great deal of emphasis on evaluating and selecting tools without defining an overall strategy. This approach often leads to the selection of inappropriate tools. A more effective technique is to define strategic objectives first, then to identify categories of hardware and software that meet these goals and finally to select the tools.

Index Systems, Inc. of Cambridge, Mass., has developed techniques that lead to the development of an effective strategy for end-user computing. The following components of the strategy are developed:

- Overall end-user computing strategy.
- Data, applications and tools.
- Technology architecture.
- Support strategy.
- Management framework.

Overall strategy

The function of an overall strategy for end-user computing is to identify the areas of an organization that offer high-impact potential to the business and would benefit from the introduction of end-user computing facilities. In developing an overall strategy, it is important to determine what end users are doing and how they could make better use of information to run the business.

Typically, the strategy focuses on key areas within the corporation that would benefit greatly from improved access to information. For example, a strategy might be based on the conclusion that executive-level decision making has the highest dollar-value impact on the corporation and that end-user computing facilities should be oriented initially toward improving the quality of decision making at the executive level. The overall strategy for end-user computing would be to target the support of fourth-generation language tools to get information into the hands of managers in high-value departments.

Changing role

Once an overall strategy has been defined, the next step is for the information systems department to take an active lead in helping end users solve their business problems. This involves a significant change in the department's role. Typically, the department is reactive: It responds to the external pressures applied by user departments. Instead of leading and controlling the evolution of end-user computing, the information systems department often reacts to the spread of personal computers by solving individual problems as they arise.

The department has to become less reactive and more proactive if it is to exert effective management and control over end-user computing. The department should be an active leader in helping users define their needs and solve business problems. Information systems has to evolve away from its traditional role of applications system development. It needs to have a greater understanding of the business side of the corporation and the information processing requirements of the business. Information systems should help users develop priorities for applications, define corporate policies that fit the needs of end users, educate and train end users and provide an officially supported kit of high-productivity tools for end users.

For traditionally oriented information systems departments, the evolution from a reactive to a proactive stance may be extremely difficult. It is hard for any department to admit it has been wrong for years. However, such an evolution can benefit both information systems and end users.

The information systems department could become proactive by working closely with end-user departments to define an advanced computing strategy that meets the business needs of these departments. A proposal from the information systems department for improved end-user computing facilities is likely to be met with an enthusiastic response such as: "Great idea — glad you finally asked for it. Let's work together on implementing the approach."

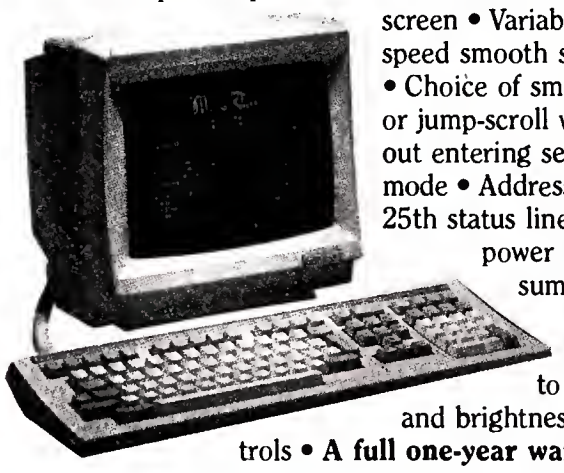
If information systems leads the movement toward effective end-user computing, the user organizations will benefit, and information systems will once again provide a highly valued service to the business.

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Upgradability. The ERGO 320 can accept an optional graphics board ($745) which will perform all Plot-10 and ReGIS functions. The graphics board, which turns an ERGO 320 into an ERGO 340, can be added to existing ERGO 320s. The small footprint is maintained when adding graphics to an ERGO 320 but must be forfeited when purchasing a VT240. **Fast, too.** In addition, our graphics offers significant speed advantages over a VT240— as much as **seven times** faster. (See an actual comparison above.)



ERGO 340
Elapsed Run Time: 11.0 sec.



DEC VT240
Elapsed Run Time: 11.0 sec.

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IN DEPTH/POWER FROM THE PRODUCTS

As part of the technology strategy, the information systems department should clearly identify the issues being addressed by an end-user computing facility:

- What types of user requirements are to be supported: office automation, word processing, system modeling, financial analysis, decision support, reporting, graphics, applications development, file management?
- What types of applications are to be supported: ad hoc query and reporting applications, personal computer-oriented individual applications, shared applications that may be used by several organizations or corporate applications requiring close information systems support and involvement?
- What are the factors driving the tool selection process: required categories of tools, integration of tools, compatible personal computer and mainframe tools, data collection and extraction facilities, transparent communications links, distributed computing networks?

Technology architecture

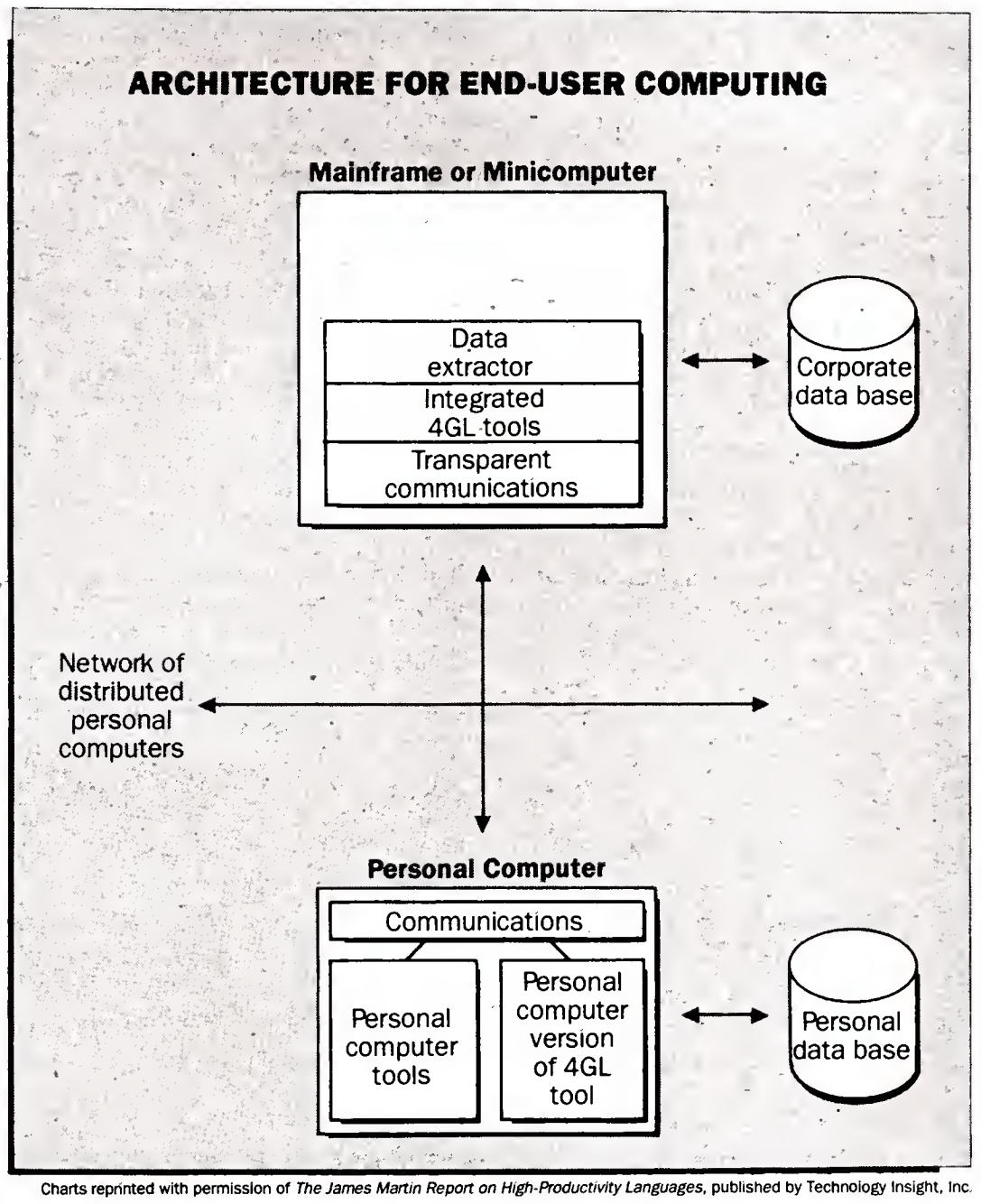
After an overall strategy for end-user computing has been defined, the next step is the identification of a hardware/software architecture that best meets the goals of the end-user computing strategy. In many cases, a distributed processing environment is recommended to support end-user computing.

Figure 1 illustrates the architecture of a distributed processing environment that has proven to be highly effective for end-user computing applications. The architecture consists of a mainframe computer (or departmental minicomputer) supported by a distributed network of personal computers or intelligent workstations. Corporate data is stored on the mainframe data base, and personal data bases are maintained by end users at the workstation level.

Access to data on the mainframe is greatly simplified through the use of compatible fourth-generation language tools on both the mainframe and personal computers. This software structure permits personal computer users to extract required data from the mainframe data base, transmit the data transparently to the personal computer and format the data for immediate use by standard tools such as 1-2-3 and Ashton-Tate's Dbase III. Alternatively, the data could be routed to the personal computer version of the fourth-generation tool for customized analysis and processing.

This architecture for end-user computing has several major advantages:

- The system provides a flexible, user-friendly environment that is well suited to the changing needs of end users.
- End users do not need programming knowledge to extract data from the central data base and process the data locally with standard personal computer tools or with personal computer versions of mainframe fourth-generation language tools.
- The personal computer version of a fourth-generation package can



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Figure 1

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be used to support customized local information processing such as data query, report generation, graphics generation, decision support and application development.

■ Applications developed in the personal computer environment can be run on the mainframe without reprogramming.

■ The information systems department can maintain effective control over end-user computing facilities as well as over access to the corporate data base.

Support strategy

Successful implementation of an end-user computing strategy often requires major changes in the structure of both management and service organizations. Information systems management should be an aggressive proponent of end-user computing. It needs to form a partnership with end users in order to ensure that computers are used effectively to solve business problems.

Many companies have undertaken major reorganizations of the functions and responsibilities associated with information services. A significant organizational change is the growing requirement for business experience in the information services staff. Frequently, the chief information officer of a large organization is both a savvy businessman and an experienced MIS manager. Information systems is being reorganized to support front-end business functions rather than back-end computational functions.

The new information systems organizations tend to be staffed with professionals who have a blend of business knowledge and technical skills. Emphasis is placed on attracting professionals with good interpersonal and communications skills who are capable of working effectively with end users.

The support of end-user computing requires many different roles, including business specialists, account executives, technical specialists, consultants on specific tools, training and education personnel and word processing specialists.

Support may also involve a telecommunications coordinator, data administration coordinator, external data base coordinator, time-sharing coordinator, hardware specialists and so on. All of these roles will occur naturally in an end-user computing environment. The challenge for information systems is to provide the specific mixture of support roles and skills that is appropriate to meet the business needs of the corporation.

Selecting the tools

The end-user computing strategy described above defines the users to be supported, the information processing needs of those users, the hardware/software architecture to be provided and the organization of support services. These elements of the end-user computing strategy should be defined prior to selecting specific tools.

Tool selection appears to be a confusing process because of the large number of competing fourth-generation products. However, selection can be simplified by making use of the end-user computing strategy defined above. The objective is to identify the small number of critical factors that differentiate appropriate from inappropriate tools for a specific end-user computing environment. For the environment shown in Figure 1, the critical factors affecting tool selection are summarized in the box below.

The function of the selection procedure is to identify tools that incorporate as many critical factors as possible. The tools that support these capabilities may then be compared and evaluated in detail.

Integrated functionality

An objective of the end-user computing strategy is to determine the primary needs of the end users. Do they need tools primarily for standalone personal computer applications, distributed processing, ad hoc queries, graphics, decision support or application development? The first step in selecting the tools is to match the primary needs of the end users to specific categories of fourth-generation language tools.

The tools can be divided into general application categories:

Tying product to application

Integrated functionality. Look for tools that provide a single integrated environment supporting multiple categories of applications, including the following: personal computer support, data base query, report generation, graphics, decision support and application development.

Distributed computing environment. Select tools that support a distributed end-user computing environment, that is, a mainframe and a distributed network of personal computers, including the following software components:

■ Integrated fourth-generation language tool on the mainframe.

■ Compatible version of the same tool on the personal computer.

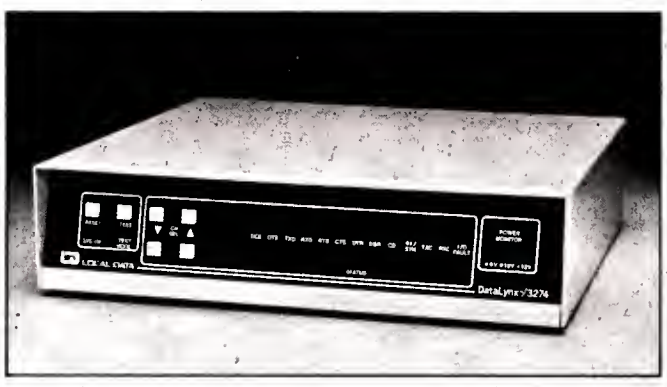
■ Data extraction software used to extract a specified portion of the mainframe data base.

■ Transparent data communications software.

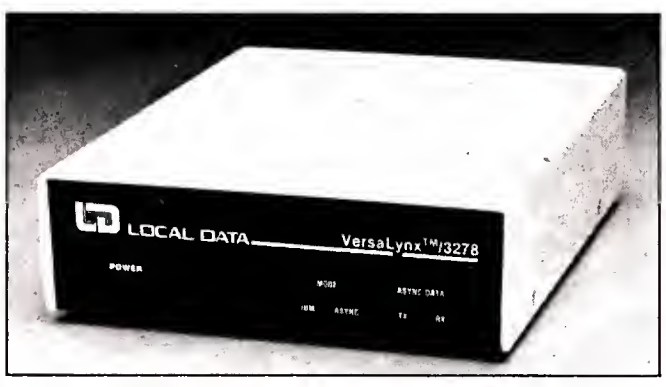
■ Interface to standard personal computer tools such as 1-2-3, Dbase III and Multiplan.

Human factoring. Look for tools that provide superior human factoring.

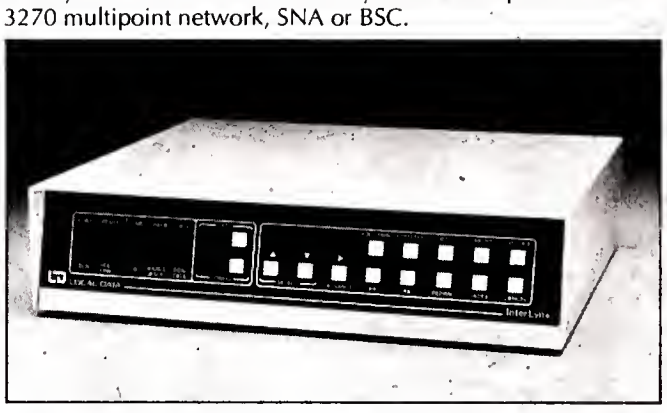
Local Data Protocol Converters



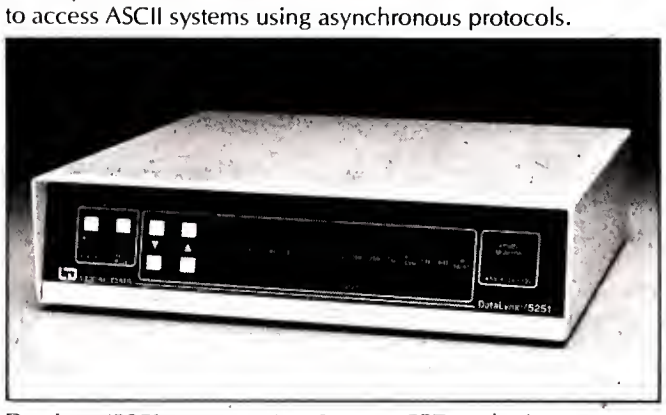
DataLynx/3274 connects 1 to 9 async CRTs and printers to a 3270 multipoint network, SNA or BSC.



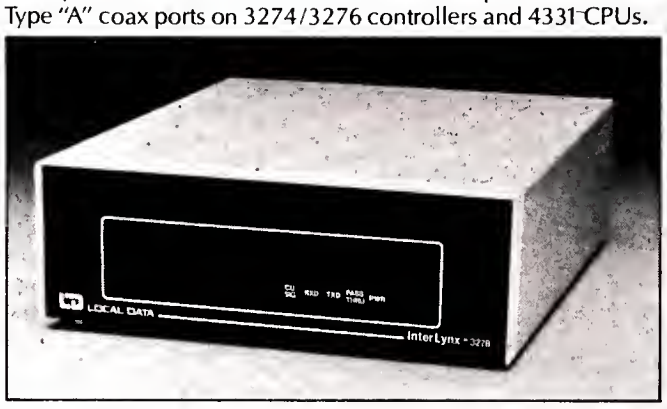
VersaLynx/3278 allows an IBM 3178/3278 terminal to access ASCII systems using asynchronous protocols.



InterLynx/3287 attaches low cost serial ASCII printers to IBM Type "A" coax ports on 3274/3276 controllers and 4331 CPUs.



DataLynx/5251 connects 1 to 9 async CRTs and printers to a system/3X host.



InterLynx/3278 attaches low cost ASCII CRT terminals or PCs to Type "A" ports.



DataLynx/3780 connects asynchronous devices or minicomputers to 2780/3780 BSC networks, and has CRT and printer port and file transfer utility.



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Many leading fourth-generation packages provide support for multiple application categories within a single integrated environment, as shown in Figure 2. This figure illustrates the major differences between products in terms of support for integrated functionality.

For example, query languages such as IBM's Query by Example and SQL/DS are limited to data base query and report generation applications. More integrated query language products such as ADRS II and QMF from IBM, Datatrieve from Digital Equipment Corp. and Intellect from Artificial Intelligence Corp. provide an additional graphics-generation capability.

Fully integrated products provide an even wider range of supported functions. Among these are Express from Management Decision Systems, Focus from Information Builders, Inc., Ramis II from Mathematica Products Group, Inc., Nomad2 from D&B Computing Services, ADS/On Line from Cullinet Software, Inc. and Natural from Software AG of North America, Inc.

Many of these products incorporate a query language, report generator, graphics generator, decision support system (DSS), application generator, personal computer version and other facilities within a single, integrated, end-user-oriented environment.

For most end-user applications, a highly integrated tool is a better choice than multiple specialized tools. With an integrated tool, the user needs to learn only one command language rather than several languages.

Product functionality matrix

Products	ENVIRONMENT					APPLICATION-GENERATION FUNCTIONS														HUMAN FACTORING			DATA BASE SUPPORT			
	IBM environment	DEC environment	Tool available only on personal computer	Micro-to-mainframe link	Full personal computer implementation	Query language	Report generator	Screen painter/data entry	Graphics generator	Decision-support tools	Subset for end users	Primarily for DP professionals	Procedural language	Interface to action diagrams	Well-structured code	Provable specifications	Heavy-duty computing	Full Cobol replacement	Recommended for info. centers	Human factoring (scale 1-5)	Help facility	Computer-aided instruction	Computer-aided thinking	Support of data base management	Standard DBMS package	Data dictionary	Data modeling tool
1-2-3	■	■	■	□	□	□	⊠	⊠	■	■	■	□	□	□	□	□	□	□	■	5	■	■	□	□	□	□	□
ADRS II	■	□	□	□	□	■	■	■	■	⊠	■	□	□	□	□	□	□	□	■	3	■	□	□	■	■	□	□
DATATRIEVE	□	■	□	■	□	■	■	■	■	□	■	□	■	□	□	□	□	□	■	3	■	□	□	■	■	■	□
INTELLECT	■	□	□	■	□	■	■	■	■	⊠	■	□	□	□	□	□	□	□	■	5	■	■	□	■	■	■	□
QBE	■	□	□	□	□	■	■	■	□	□	■	□	□	□	□	□	□	□	■	4	□	□	□	■	■	□	□
QMF	■	□	□	□	□	■	■	■	■	⊠	■	□	□	□	□	□	□	□	■	4	■	□	□	■	■	■	□
SQL/DS	■	□	□	□	□	■	■	⊠	□	□	■	□	■	□	⊠	□	□	□	■	3	■	□	□	■	■	■	□
TELL-A-GRAF	■	■	□	■	□	■	□	■	■	□	■	□	□	□	□	□	□	□	■	4	■	■	□	□	□	□	□
EXPRESS	■	□	□	■	□	■	■	■	■	■	■	□	■	□	■	□	□	□	■	4	■	■	□	■	■	■	□
SYSTEM W	■	□	□	■	■	□	■	■	■	■	■	□	⊠	□	□	□	□	□	■	3	■	■	□	■	■	■	□
FOCUS	■	□	□	■	■	■	■	■	■	⊠	■	■	■	□	⊠	□	⊠	■	■	4	■	■	⊠	■	■	■	□
NOMAD2	■	□	□	■	■	■	■	■	■	⊠	■	■	■	□	□	□	□	■	■	3	■	⊠	□	■	□	■	□
RAMIS II	■	□	□	■	■	■	■	■	■	■	■	■	⊠	□	⊠	□	□	⊠	■	3	■	■	□	■	■	■	□
ADS/ON LINE	■	□	□	■	□	■	■	■	□	□	■	■	■	□	⊠	□	■	⊠	■	3	■	□	□	■	■	■	□
DMS	■	□	□	□	□	■	■	■	□	□	⊠	■	□	□	□	□	■	□	□	1	□	□	□	■	■	■	□
IDEAL	■	□	□	□	□	□	■	■	□	□	⊠	■	■	□	■	□	■	■	□	3	■	□	□	■	■	■	■
APPL. FACTORY	□	■	□	□	□	■	■	■	□	□	■	■	■	■	■	□	■	■	■	4	⊠	□	■	■	□	■	□
MANTIS	■	□	□	■	■	□	□	■	■	■	■	■	■	□	⊠	□	■	⊠	□	3	■	□	□	■	■	⊠	□
NATURAL	■	■	□	■	□	■	■	■	■	□	■	■	■	□	⊠	□	■	■	⊠	3	■	□	□	■	■	■	□
USE.IT	□	■	□	□	□	□	⊠	⊠	□	□	□	■	■	□	■	■	□	⊠	□	2	□	□	□	□	□	■	□

■ — function available □ — function not available ⊠ — function partially available

Figure 2

Moving data

In addition, the movement of data within an integrated tool is much easier than the transfer of data between multiple tools that were not designed to operate within a single integrated environment. For example, for decision support applications, it is far more efficient to use a single integrated tool such as Express or System W than three separate tools such as Focus, Tell-a-Graf and IFPS from Execucom Systems Corp.

Similarly, for users requiring data base query, reporting, graphics and application generation capability, it is much simpler to use an integrated application generator such as Focus, Nomad2, Ramis II, ADS/On Line or Natural, rather than a combination of less integrated tools such as SQL/DS, Tell-a-Graf and DMS. The objective should be to select a small number of powerful, highly integrated products rather than a larger number of specialized tools.

In addition to matching a fourth-generation language tool to the range of user requirements, it is important to determine whether the underlying data base model of the tool matches the application. This is particularly important in comparing DSS such as Express and System W with application generation systems (Focus, Nomad 2, Ramis II, Natural, ADS/On Line, Mantis and Ideal). There are major differences between the data base structures utilized by DSS and application generation systems.

DSS were designed to utilize array-based data models such as spreadsheets and multidimensional data structures. These data structures are ideally suited to complex strategic planning and financial analysis applications. In contrast, application generation systems are based on relational, hierarchical or network data models, which were designed for record-oriented transaction processing applications. Many of the characteristics of DSS are diametrically opposed to the characteristics of application development systems.

In general, DSS such as Express or System W should be considered for financial applications such as strategic planning, policy calculations, marketing analysis, financial analysis, financial modeling, budgeting and financial consolidation. These applications require the aggregation of data from a wide variety of sources and the analysis of this data in multiple dimensions.

Application development tools are appropriate for more routine, short-term, production-oriented applications, such as transaction processing, file sorting, file updates and specialized reporting. These applications require a record-oriented data base model that is fundamentally different from the array-based data models used in DSS. If the data model utilized by the tool does not match the application, then it is not an appropriate tool.

> *"In addition to matching a fourth-generation language tool to the range of user requirements, it is important to determine whether the underlying data base model of the tool matches the application.*

The conclusions that can be drawn thus far in the selection process may be summarized as follows:

■ Whenever possible, select highly integrated tools that support multiple categories of applications rather than specialized tools that support only a few application categories. The most highly integrated tools are Focus, Nomad2, Ramis II and Express, followed by ADS/On Line, Natural and System W.

■ Array-oriented DSS such as Express and System W are fundamentally different from record-oriented application generation systems such as Focus, Nomad2 and Ramis II.

In general, these application categories should not be mixed. For example, Express and System W should be used primarily for DSS applications, while Focus, Nomad2, Ramis II, ADS/On Line and Natural should be used primarily for application generation.

Distributed computing

A representative distributed processing system that is well suited for end-user computing was presented in Figure 1.

The recommended software components of the system on the mainframe include the following:

■ Integrated fourth-generation language tool.

■ Data extraction and transparent data communications facility.

Recommended software components on the personal computer include:

■ Personal computer version of

the same fourth-generation language tool that is on the mainframe.

■ Interface to standard personal computer tools such as 1-2-3, Dbase III and Micropro International Corp.'s Wordstar 2000.

Recent advances

Within the past year, vendors have made significant advances in supporting the distributed processing environment shown in Figure 1.

Five fourth-generation language tools now are available in both a mainframe and a personal computer version: PC/Focus, Ramis II/PC, Nomad2/PC, Cricket (a personal computer version of Mantis) and Micro W.

Micro W is a restricted, two-dimensional personal computer version of System W.

A personal computer version of Express, capable of multidimensional data manipulation, is scheduled for release in the third quarter of 1985.

Two of these products (PC/Focus and Micro W) are available on the IBM Personal Computer, Personal Computer XT or Personal Computer AT.

The other three are available only on the IBM Personal Computer XT/370.

In general, the Personal Computer, XT or AT are a better choice of machine than the XT/370 for the following reasons:

■ Personal Computers and IBM-compatible Personal Computers are much more widely used than XT/370 Personal Computers.

■ Software for the XT/370 is simply a version of a mainframe program running under VM/CMS that has been downloaded to the XT/370. Because of the limited paging space on that machine, these programs tend to run slowly and inefficiently.

■ XT/370 programs generally operate in emulated 3270 mode and do not make effective use of the graphics capability of the Personal Computer.

■ Software written specifically for the Personal Computer, XT or AT can be made to run efficiently on the Personal Computer and can use its full graphics capabilities.

Extensive use of color and multidimensional window displays can significantly enhance the human interface to the Personal Computer.

At the present time, Focus is the only full-function application generation tool available both on a mainframe and on a Personal Computer, XT or AT. Ramis II, Nomad2 and Mantis are secondary choices because of their reliance on the XT/370 Personal Computer for the Personal Computer version of the tool.

ADS/On Line and Natural are in the third rank, since they do not provide a Personal Computer version of the mainframe product.

However, they do support an integrated interface to standard Personal Computer tools. DMS, Ideal and Application Factory do not provide any integrated support for a personal computer.

Human interface

The Personal Computer versions of these languages generally are easier to use than their mainframe counterparts. The flexibility, speed and graphics capability of the Personal Computer enable vendors to implement much more user-friendly interfaces incorporating multiple alternative command interfaces, rapid on-line interaction, two-dimensional display dialogues, overlaid display windows, graphics symbols and mouse interfaces.

The Personal Computer provides vendors with an opportunity to rethink completely the human interface to the tool.

The Personal Computer version of Focus incorporates some of the best new ideas in human factoring. Although it does not compare to the ease of use of Apple Computer, Inc.'s Macintosh, PC/Focus does support a window-driven command interface that greatly simplifies data base query, data extraction, data download and reporting operations.

Query languages and report generators such as



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ADRS-II, Datatrieve, Easytrieve, Inquiry and SQL/DS require a rigid command syntax that is difficult to remember. The QBE component of QMF provides a simpler end-user interface based on table layouts. Intellect is the simplest query language to use because it utilizes the syntax of natural English.

It is the only data base query tool that enables a non-DP professional to solve business problems at a consistently high level of abstraction.

At present, Intellect is limited to read-only queries for well-structured, well-defined data bases.

Some of the leading DSS and application generators offer a variety of human interfaces. Express, Focus and Ramis II provide the widest choice of end-user interfaces, including natural English, menu structures and near-English commands. Natural, Mantis and Ideal provide a choice between a menu and a command language interface.

Most fourth-generation languages provide only a command language interface.

In order to support a spectrum of end users with widely varying levels of experience, it is important to select tools that offer a variety of human interfaces, preferably including natural English, window-driven menu structures and near-English commands.

For DP professionals, a well-structured procedural language used for specifying detailed logic is also essential. The procedural language should incorporate structured facilities, such as action diagramming techniques, that simplify the specification of complex logical procedures.

Choices ahead

There are now relatively few integrated fourth-generation languages that support the distributed end-user computing facility described in Figure 1.

Selection factors for this facility include the following: The tool should enable personal computer users to query and extract mainframe data, download the data to the personal computer and manipulate it locally with standard personal computer tools or with a personal computer version of the mainframe tool.

The choice of integrated tools for this end-user computing facility was narrowed to five: System W for decision support applications and Focus, Ramis II, Nomad2 and Mantis for application development.

Leading contenders

System W and Focus were considered to be the leading contenders for the facility, since the personal computer versions of these products run on the IBM Personal Computer rather than the less desirable XT/370.

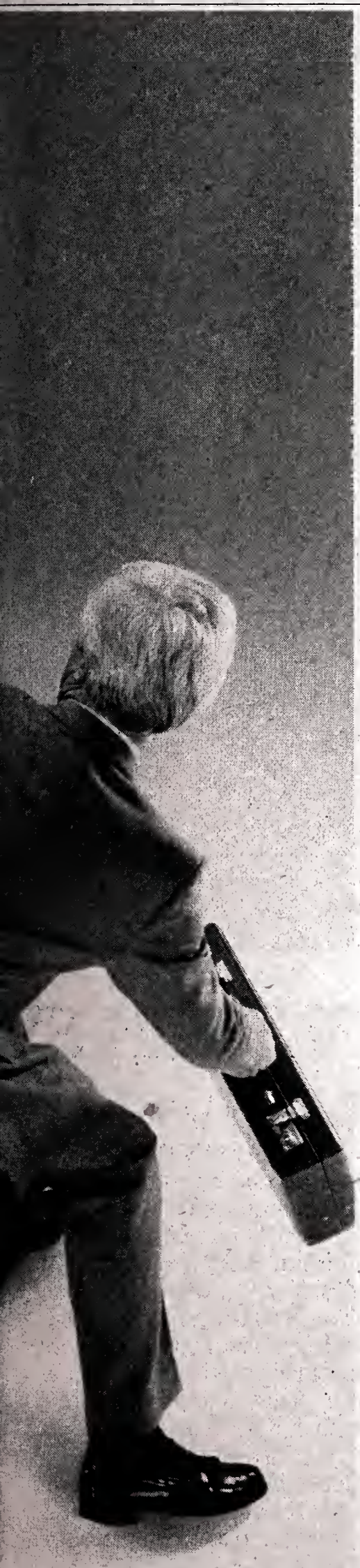
ADS/On Line and Natural would be considered for the facility if a personal computer version of the mainframe tool were not required.

The field of fourth-generation languages is changing rapidly as vendors add end-user-oriented capability to their products.

Changes are particularly rapid in the area of personal computer/mainframe integration. Organizations can expect a much broader choice of products for a distributed end-user computing environment in the near future.

About the author

Pieter Mimno is president of Technology Insight, Inc. of Marblehead, Mass., which publishes The James Martin Report on High-Productivity Languages. *The Martin Report is a new information service that provides continually updated information on high-productivity tools. Editor and coauthor of The Martin Report, Mimno has 24 years of experience in the computer field and does independent consulting.*



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IN DEPTH

Information Centers

Information Systems

Divided They Stand

By Robert Head

There are strong arguments for separating the functions of the information resource center from the activities of the information systems department. An organizational separation helps ensure that the individuals or unit responsible for assisting users will not be distracted by other assignments. Those in charge will not be pulled away by the fire fighting that goes on continuously in most information systems departments.

There is a more compelling reason for the separation: to overcome

Reprinted, by permission, from Planning and Implementing Information Resource Centers, *by Robert V. Head. Copyright © 1985 by QED Information Sciences, Inc., Wellesley, Mass. 02181.*

the sometimes formidable psychological inhibition that some users have built up toward dealing with technicians. In the past, a closed-shop environment discouraged users from dealing with the information systems department except for analyzing requirements at the inception of a systems development project.

Aside from this interaction, the user interface has been minimal. There are, of course, problem situations when user projects are not receiving sufficient priority, reports from the center are not on time, response time from mainframe to terminals is degraded and so on. Too often, a gulf has grown up between the systems staff and the user community, and the relationship is sometimes marked by an attitude of mutual suspicion and even hostility.

To overcome these barriers, it is best to make a bold psychological statement by divorcing the information resource center from the systems department. This separation may involve putting the information resource center director on the same reporting level as the information systems director — that is, both reporting to the senior vice-president for administration, or placing the information resource center in an entirely different organizational entity, such as the personnel department. Users can then take advantage of information resource center capabilities without the inhibitions that they sometimes feel when dealing with computer professionals.

Regardless of where the center is lodged organizationally, it should cultivate active participation and involvement by representatives of the key line departments served by the center. A good way to do this is to establish an advisory board of senior executives from the line organization. The board should function much like a board of regents for an educational institution, working with the information resource center staff to ensure the right mix of activities.

Site selection

One of the most critical decisions in launching the information resource center is the selection of an appropriate location. The center must be made attractive and accessible to all categories of users who will be encouraged to visit and take advantage of the center's capabilities. It should be in a highly accessible, heavy traffic location so that users can conveniently stop by.

Demonstrations do not have to be provided on the spot for the drop-in visitor, but an initial contact can be made and the visitor scheduled to return for a tutorial or demonstration. The size and layout of the center will be dictated by the types of services to be provided.

Demonstration and work area. There should be several workstations, typically anywhere from three or four to a dozen, where personal computers and software packages can be displayed and demonstrated. If hardware has been standardized, these stations can be configured identically; otherwise, they must accommodate a variety of hardware and software products from different vendors.

Space planning for this area should emphasize flexibility. A given workstation may at one time be used by an individual working on his own and at other times by small groups of up to a half-dozen people who gather around the device for a demonstration.

Users, especially neophytes, want considerable privacy when working on their own or with a center staff member. Top executives are especially sensitive in this regard. Many of them are older and less attuned to computer technology, more hesitant to get their feet wet. Moreover, top executives may be reluctant to demonstrate their lack of knowledge in front of peers and subordinates.

These considerations make it desirable to have private rooms or carrels that can be partioned for privacy. Easily movable partitions are a possibility, but care should be taken that there are adequate electrical outlets and conduits to permit panels to be shifted. If a large open room is to be partitioned, it should be done intelligently. The center, as well as the sides of the room, should be devoted to workstations.

One poorly planned center consisted of a large room in which all the equipment was placed against the four walls with nothing but a large open space in the center. This represents not only poor use of space but deprives users at the various workstations of much-needed privacy.

Training and conference facilities. Besides space for demonstrations and hands-on use of equipment, there should be facilities for conducting courses and seminars. Some information resource centers may be able to take advantage of training rooms already available, but it is desirable to earmark at least a small training or conference room physically associated with the center. Classroom facilities should have the capability of presenting live demonstrations of hardware and software. Personal computers or terminals should be installed or brought into the facility for particular training purposes.

Large screen displays are mandatory in training situations involving more than a handful of people. Also, the well-equipped information resource center should contain videocassette equipment and a videocasette recorder (VCR) library of instructional materials.

There is a wealth of video instructional material available from a number of training organizations, including introductory and advanced self-instruction courses in personal computers and in a variety of programming languages and application packages. Many of these courses permit the student to combine video

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Library. Users of the information resource center will benefit greatly from the availability of a well-stocked, well-organized library. Besides books, periodicals and vendor literature, the library could contain a variety of VCR and CBT courses and, even more important, copies of software packages. A visitor could browse through the written material, select a training cassette or diskette containing a programming language, data base management system or other software to use at one of the personal computer stations.

> ”
>
> *Security is especially important for valuable VCR course materials or proprietary software packages.*

Care must be taken in determining what goes into the library. Ground rules for withdrawal and use of library materials should be established. Security is especially important for valuable VCR course materials or proprietary software packages. Some information resource centers do not permit users to remove library materials from the premises. Other centers allow users to withdraw materials, including software packages and even hardware, to work with in their offices or homes.

If loans are permitted, there must be rigorous controls. Most software vendors have strict prohibitions against copying proprietary packages. The information resource center could be vulnerable to legal action if piracy occurs.

Once the basic layout of the center is decided, attention must be paid to ordering furniture and equipment and planning detailed layout. There are several sources for special partitions and furniture designed to facilitate computer usage. For instance, panels may contain the necessary wiring for the equipment, which helps avoid the problem of loose wires or electrical conduits on walls or floors.

Because most centers try to attract the executive computer user, funishings should reflect the kind of environment appropriate for an executive visitor.

This setting includes not only comfortable furniture but such amenities as subdued lighting, plants, paintings and premium carpeting.

In laying out the information resource center, it is wise to consult an interior designer who can assist in space planning, layout and selection of furniture and fixtures. Expert advice should also be sought about such environmental aspects as adequate electrical wiring, air-conditioning and the need for special cabling to interconnect center equipment.

The foregoing has focused on site selection and planning for a single information resource center. Typically, such a center would be located at company headquarters. In most organizations, this raises the question as to what, if any, type of facility should be made available at other locations.

Should there be carbon copies of the center located at branch offices or should field employees be encouraged to come to headquarters to take advantage of the information resource center? If we are talking about a large bank located, say, in New York City, then a single information resource center may be conveniently accessible by most employees.

But if we are dealing with a large federal government agency with tens of thousands of employees dispersed throughout the country, or perhaps even worldwide, it may be productive to duplicate the facilities of the information resource center in multiple locations.

If duplication is a requirement, it is advisable to start out with a pilot information resource center at the headquarter's location to gain operating experience before branching to other locations.

Staff requirements

The information resource center is intrinsically different from other information services that have been offered in the past. Most well-managed information systems departments have, in recent years, gone to some pains to train systems analysts to become more adept at working with users in defining their requirements.

In some instances, this has involved setting up an information center where users can retrieve information and interact with mainframe computers, assisted by a trained technical staff. The information resource center goes beyond these service concepts.

Typically, the staff of the center is quite small compared with the professional staff found in the information systems department. Usually,

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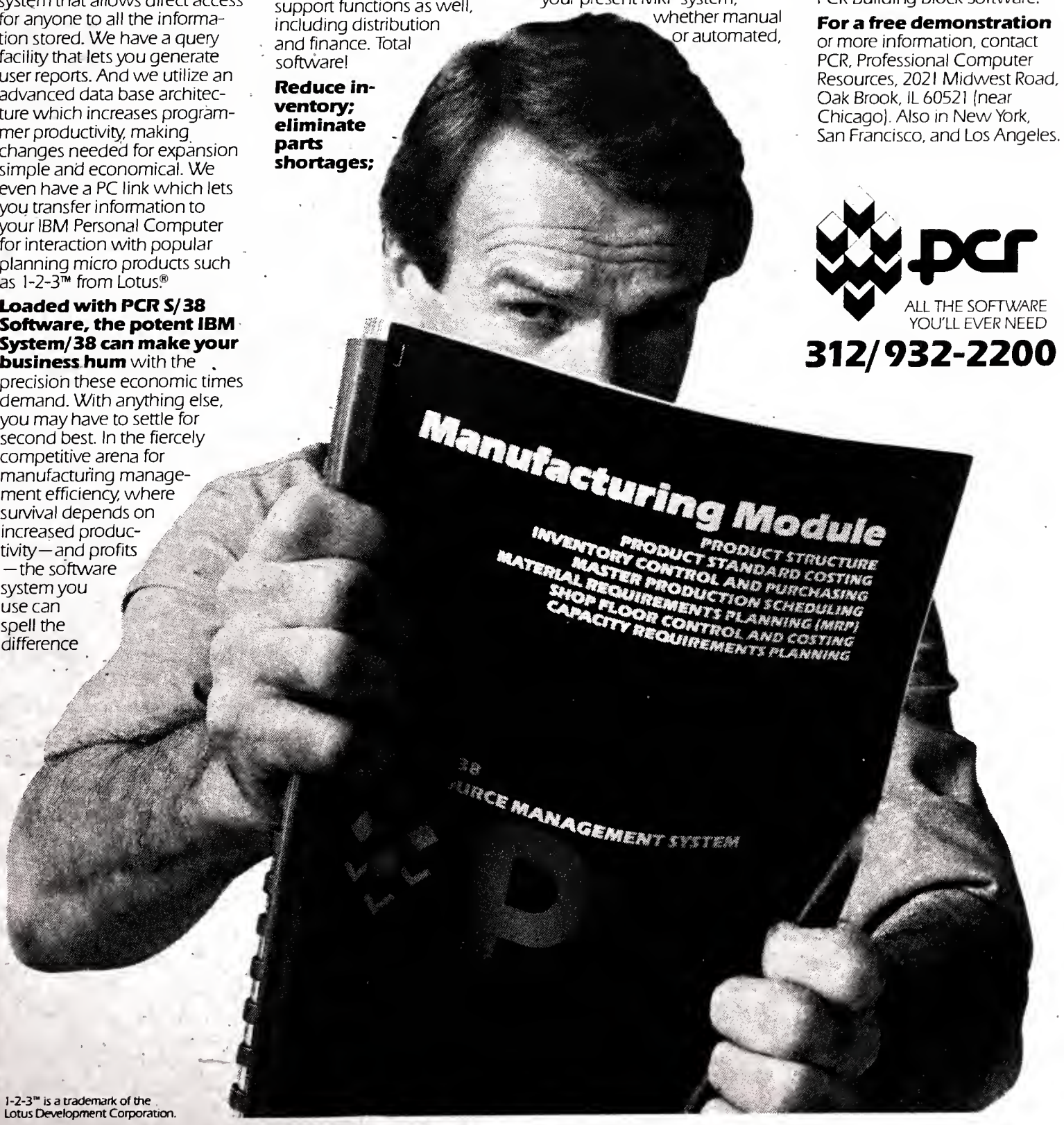
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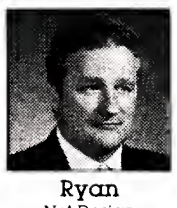
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IN DEPTH/INFORMATION CENTERS

the center is operated by a staff of from three to a dozen employees. The number of employees depends upon the level of demand for service, the types of services provided and the extent to which outside part-time consultants are used for training and technical support.

Regardless of size, information resource center staff members should either individually or in combination possess a blend of training and interpersonal communication skills along with a good knowledge of hardware and software technology and applications. Most important is a sensitivity to the special needs of managers and employees throughout the organization. The most successful centers have a director with good communication skills and the ability to interact with top management and build networks of supporters and clients.

Most information resource centers offer an array of services with heavy emphasis on training and familiarity with a variety of hardware and software. Before the services can be identified and planned for a particular organization, several issues must be weighed. Resolution of the following issues will define the services to be offered and help set budget and staffing requirements.

Will the center be reactive or proactive? This issue has to do with whether the organization wishes to encourage acquisition and use of microcomputers or prefers to react to demand for them as it arises. Under the reactive approach, those responsible for the information resource center can plan its services around identifiable user demand.

If users have begun requisitioning IBM Personal Computers in large numbers, for instance, then training and assistance for this product should be available in the center. If the engineering department has a strong interest in graphics, or the accounting department has made a commitment to acquire a certain spreadsheet package, these preferences would provide leads to what the information resource center should emphasize.

The reactive approach is often coupled with a micro acquisition policy that is intended to discourage rampant use of personal computers for whatever reason, for example, spare capacity available on the mainframe or lack of budgetary resources for equipment purchase.

In the proactive operating mode, the center is committed to technology push. It aggressively seeks to introduce new technology that offers the potential for increased productivity and enhanced employee performance. The center tends to be out in front of user demand. It may offer training on the Unix operating system — even though most users are content with Digital Research, Inc.'s CP/M — in anticipation of the need for handling multiple jobs on a 32-bit supermicro. Windowing may be highlighted as an attractive feature for executive workstations. And a mouse may be provided for the personal computer, along with the requisite software, to demonstrate interaction without keyboarding.

A decision on this issue involves a judgment as to the best way to deal with technology transfer. A proactive stance, while interesting and exciting, may encourage unneeded expenditures by users and run counter to efforts to achieve standardization and interoperability among equipment. The reactive approach, on the other hand, reduces the information resource center leadership role in technology transfer because the staff must wait for strong user demand before responding.

This demand may be engendered through vendor marketing, articles in the popular and business press and other outside pressures that do not necessarily contribute to the company's best long-range information processing interests.

Will the center stress packages or classroom training? As the information resource center phenomenon gains momentum, the problem of providing high-quality training at a reasonable cost becomes acute. Classroom training in certain subjects is undoubtedly desirable, but the issue is the amount of classroom training that can be provided.



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There is usually a shortage of qualified instructors, especially if the information resource center staff is small. And these instructors obviously cannot be skilled in all the software packages of potential interest to clients. Even though in-house training skills can be augmented by outside professional instructors, many information resource centers are turning to other instruction modes to get the maximum leverage from the center's resources.

Video instructional packages are widely used in information resource centers. Another popular aid is computer-based training, in which the computer itself takes the user step by step through self-instructional material. As a practical matter, most centers try to combine the best aspects of formal classroom training, automated training programs and one-on-one personal tutoring. The issue is which method to emphasize.

Will the information resource center be single product or multiproduct?

If management decides to standardize on the IBM Personal Computer, for example, the information resource center's hardware selection can be simplified: The center will support any kind of hardware device so long as it is an IBM Personal Computer (or perhaps one of the IBM-compatible computers).

Of course, things can still get complicated when it comes to software, even in a one-product center. Should Lotus Development Corp.'s 1-2-3, for instance, be adopted as the standard data base management package for the microcomputer, or should another package with similar capabilities be acquired? For every leading brand of personal computer, a wide selection of software packages is available for spreadsheet analysis, word processing and the like, with new — and presumably improved — versions becoming available almost daily.

If there is no company-wide hardware standard, the center must determine which products to acquire and support. In this case, it may be prudent to standardize on software so that users are permitted to acquire any computer they desire provided it runs under, say, Unix, or are free to order their own computers but must use Microsoft Corp.'s Multiplan if they wish to do spreadsheet work.

The multiproduct vs. single product decision is complicated by the fact that significant new product offerings are common in today's rapidly changing microcomputer marketplace. An equipment standard that makes sense today may seem archaic a year from now.

As with the other issues we have cited, compromise strategies may prove the most effective. One brand of micro may be showcased in the information resource center, for example, as the preferred system for the organization, along with a half-dozen or so software packages falling into generic categories such as word processing and spreadsheets. However, other product offerings may also be supported by the center for those who cannot satisfy their requirements through use of the standard configuration.

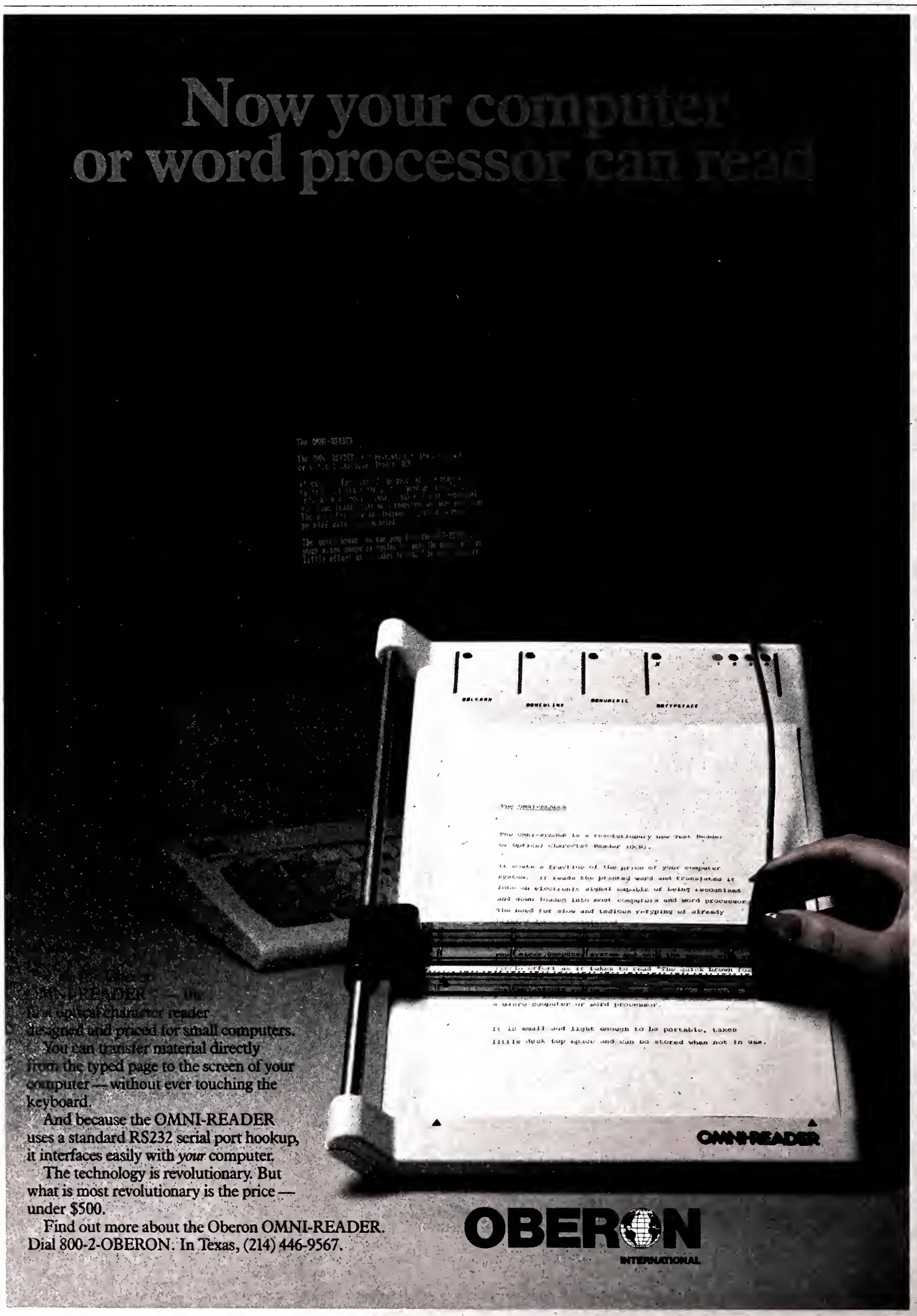
Will the center support both mainframe and microcomputer processing? Most of the information resource centers being opened today are microcomputer-oriented, though the demarcation line between micro use and use of the facilities at a remote mainframe computer center is not always clear.

The microcomputer is being viewed increasingly by users and experts as both a stand-alone computational device and an intelligent terminal that can be operated on-line to a remote computer for certain processing tasks. This means that the information resource center, if it is to stay abreast of technical developments and user interests, must be able to train its clients in remote as well as stand-alone computing.

Thus, microcomputers in the center may be interconnected to form a local-area network or networked to a remote larger host that could be either a departmental minicomputer or a mainframe operated by the information systems department.

About the author

Robert Head is president and principal consultant of Capit (a Company for the Analysis and Planning of Information Technology), in Stafford, Va. He has more than 20 years of experience in information systems planning.



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MICROCOMPUTERS

Grid launches plasma-display portable micro

By Kathleen Sullivan
CW West Coast Bureau

MOUNTAIN VIEW, Calif. — Grid Systems Corp. last week broke new ground in the computer industry with the introduction of a briefcase-size portable computer that features a plasma display. Known as the Gridcase III, the magnesium-encased unit includes a 3½-in. disk drive and is fully IBM compatible, the firm said.

The company also introduced enhancements to its Grid Server network. The products will provide mainframe communications capabilities and offer support for Microsoft Corp. MS-DOS file sharing, the company said.

The Gridcase III is one of a trio of IBM-compatible systems that will make up the Gridcase family, the company's newest computer line. Also included in the lineup are the Gridcase I and II, which feature two types of LCDs. The Gridcase portables weigh about 12 pounds.

The Gridcase line, which is based on a 16-bit Intel Corp. 8086 microprocessor

See **GRID** page 72

Digital Research announces GEM application programs

Enhance graphics, WP on IBM, MS-DOS micros

By Kathleen Sullivan
CW West Coast Bureau

MONTEREY, Calif. — Digital Research, Inc. last week announced a set of applications packages designed to run under its Graphics Environment Manager (GEM), an operating system extension that is said to provide a visual interface for IBM Personal Computers.

Introduced last November, GEM is said to give users access to the world of icons, pull-down menus, windows and mice championed by Apple Computer, Inc. with its Macintosh computer.

GEM provides a Macintosh-like user interface to Microsoft Corp.'s MS-DOS and Digital Research's Concurrent DOS-based systems, the company said. One of GEM's strong points, the firm said, is that it brings a graphics interface to systems with color screens. By contrast, the Macintosh uses a black-and-white monitor.

Digital Research also unveiled six software programs, including GEM Desktop, GEM Paint, GEM Draw, GEM Write, GEM Graph and GEM Wordchart. The firm also announced plans to bundle three of the programs — Desktop, Paint and Write — as the GEM Collection.

The GEM Desktop's visual interface eliminates the need for users to learn operating system commands, the company said, because it replaces commands with icons that represent various computer functions. The GEM Desktop includes icons for a wastebasket, file folders and disks, the firm said.

With a few keystrokes or clicks on the mouse, users can create a file, delete a file or run a software program using the GEM Desktop, the company said. The GEM Desktop is also said to include a calculator and a clock.

The company described its GEM Paint software as a graphics design program that allows users to paint pictures on the screen. The program offers users a choice between a variety of brush sizes and fill patterns. The company said users will also be able to edit pictures by altering individual pixels on the screen.

The GEM Draw program is said to allow users to create and edit charts and diagrams. It includes a library of predesigned

See **GEMS** page 74

■ Ericsson Information Systems announced a 15-lb IBM-compatible system with a high-resolution plasma screen/**66**

■ IBM unveiled PC/Colorview, a videotex access package for the IBM Personal Computer/**70**

■ Whitesmiths upgraded its C compiler for micros based on the Intel 8086 chip family/**70**

INSIDE

Software/**70**

Micro managers discuss national association

By Edward Warner
CW Staff

CHICAGO — Efforts are under way among regional chapters of the Microcomputer Managers Association (MMA) to form a national association that would push for greater responsiveness from personal computer hardware and software vendors.

Discussion of a national micro managers association comes in the wake of the decision last month by New York City's MMA to oppose completely the software protection scheme proposed by the Association of Data Processing Service Organizations, Inc. (Adapso) [CW, March 11]. The Adapso proposal would urge its members who produce microcomputer software to use a hardware lock-and-key scheme to prevent unauthorized software duplication.

The regional MMA chapters are fully autonomous, but 17 MMA members from among the eight chapters nationwide met March 30 in Chicago to organize a national association. No name has yet been set for the new group, although several attendees said that the acronym Tasc, which stands for Technology Advancement through Strategic Cooperation, is under consideration.

Improved vendor responsiveness

A member of Michigan's MMA, Steven Hochberg, was assigned the task of coordinating work on a proposed charter. Hochberg, an executive with Complete Technologies Corp., an Elmhurst, Ill., vendor of microcomputer support services, said the new association would work for improved vendor responsiveness to the needs of corporate users. He added, however, that boycotts of products or services "would never be used."

Another member of the Michigan MMA at that Chicago meeting, Doug Richardson, said that the flexing of corporate purchasing muscle would be an option.

"There are instances where software companies seem indifferent to fixing problems with their products," Richardson said. "We as a group can probably bring some leverage to bear because we represent multimillion dollar sales."

Packages for Macintosh grab limelight at Softcon meeting

By John Gallant
CW Staff

ATLANTA — Software for Apple Computer, Inc.'s Macintosh paced the product introductions at the 1985 Softcon conference here early this month.

Intermatrix unveiled several Macintosh products, including its Macdesk desk accessory program. According to a company spokesman, Macdesk operates as a desk accessory running in the background, so its functions are available regardless of the application running on the micro.

Macdesk is divided into four components: desktop organization, telecommunications, personal information files and office productivity.

Desktop organization features include calendar/appointment books, multiple appointment alarms, a calculator, an analog clock, a "things-to-do" list and bank account and credit card listings.

Personal information files are reportedly maintained as a set of Rolodex-like cards.

Telecommunications capabilities include both background terminal software for use with all modems that are Hayes Microcomputer Products, Inc. compatible and autodialing of standard telephones with Intermatrix's Phonelink accessory, which al-

See **SOFTWARE** page 74

Sytek gives net overview

MICRO BITS
Thomas Madron

At the winter meeting of the Sytek Network User's Group (Snug) in Portland, Ore., Sytek, Inc. provided some interesting insights into the development directions it would like to see for IBM's PC Network, which is a version of Sytek's Localnet/PC.

Sytek's fundamental perspective is that the personal computer market is driven by IBM, which dramatically influences Sytek's view of the market for the PC Network. "IBM offers [high-performance] products that define de facto standards and provide software interfaces and support to third-party developers," according to Phil Edholm, Sytek's manager of market development.

While Sytek recognizes the importance of IBM's endorsement of Localnet/PC, the company also recognizes the need for a broader perspective. The PC Network is part of

See **SYTEK** page 73

Madron is manager of computer services at North Texas State University in Denton, Texas.

Ericsson portable features plasma screen

Built-in printer, RAM disk optional

GREENWICH, Conn. — Ericsson Information Systems has introduced the Ericsson Portable PC, an IBM Personal Computer-compatible system that features a high-resolution plasma screen and weighs 15 lb.

The plasma screen, which generates its own light rather than depending on reflected light as LCD screens do, provides 25-line by 80-col. text or 640- by 400-pixel graphics display, according to the firm.

Built around an Intel Corp. 8088 microprocessor, the Ericsson Portable PC costs $2,995 and includes a single third-height 360K-byte floppy disk drive, 256K bytes of random-access memory (RAM) expandable to 512K bytes, a detachable keyboard and serial and parallel ports.



Ericcson Portable PC

Limited deliveries will begin this month, and volume shipments will start in the fall, the company said.

Options will include a 512K-byte RAM disk priced at $900, a $395 built-in 40 char./sec. printer that adds 2 lb to the overall system weight, a 300/1,200 bit/sec. modem that will cost $300, a $450 external floppy disk drive and a $500 expansion box that accepts two IBM-compatible boards.

More information may be obtained from Ericsson Information Systems, Greenwich Office Park 1, Greenwich, Conn. 06836.

CXI unveils coaxial connection

PALO ALTO, Calif. — CXI, Inc. has announced the 3278/79 Standard coaxial connection, an IBM 3270 terminal emulation board that is said to be compatible with the Digital Communications Associates, Inc. (DCA), Irma board.

The CXI product reportedly performs full 3278/79 emulation to enable the IBM Personal Computer, Personal Computer XT and AT to access and process IBM 3270 mainframe applications. The 3278/79 Standard supports micro and mainframe applications software and file transfer software designed for the Irma board, according to the vendor.

The product is said to be software loadable to allow future product enhancements to be provided on diskettes.

The 3278/79 Standard also provides an interface that is reportedly compatible with the DCA Irma Decision Support Interface, allowing it to run Irma-compatible micro applications programs such as emulators, file transfer programs and micro-to-mainframe links. The interface board links the micro to an IBM 3274 or 3276 cluster controller and requires 96K bytes of memory with DOS Version 2.

In addition to basic 3278/79 functions, the 3278/79 Standard coaxial connection is said to provide screen print, screen save to disk and a screen control applications program interface.

The CXI 3278/79 Standard coaxial connection costs $895.

The vendor is located at 3606 W. Bayshore Road, Palo Alto, Calif. 94303.

ITT cuts micro prices up to 40%

SAN JOSE, Calif. — ITT Information Systems lowered prices on its IBM-compatible personal computer systems by up to 40%.

The price of the Xtra Model II, with 256K bytes of random-access memory (RAM) and dual 360K-byte floppy drives, dropped from $1,895 to $1,595.

The Model III, which includes 256K bytes of RAM, a single floppy disk drive and a 10M-byte hard disk drive, has been lowered to $2,595 from $4,395.

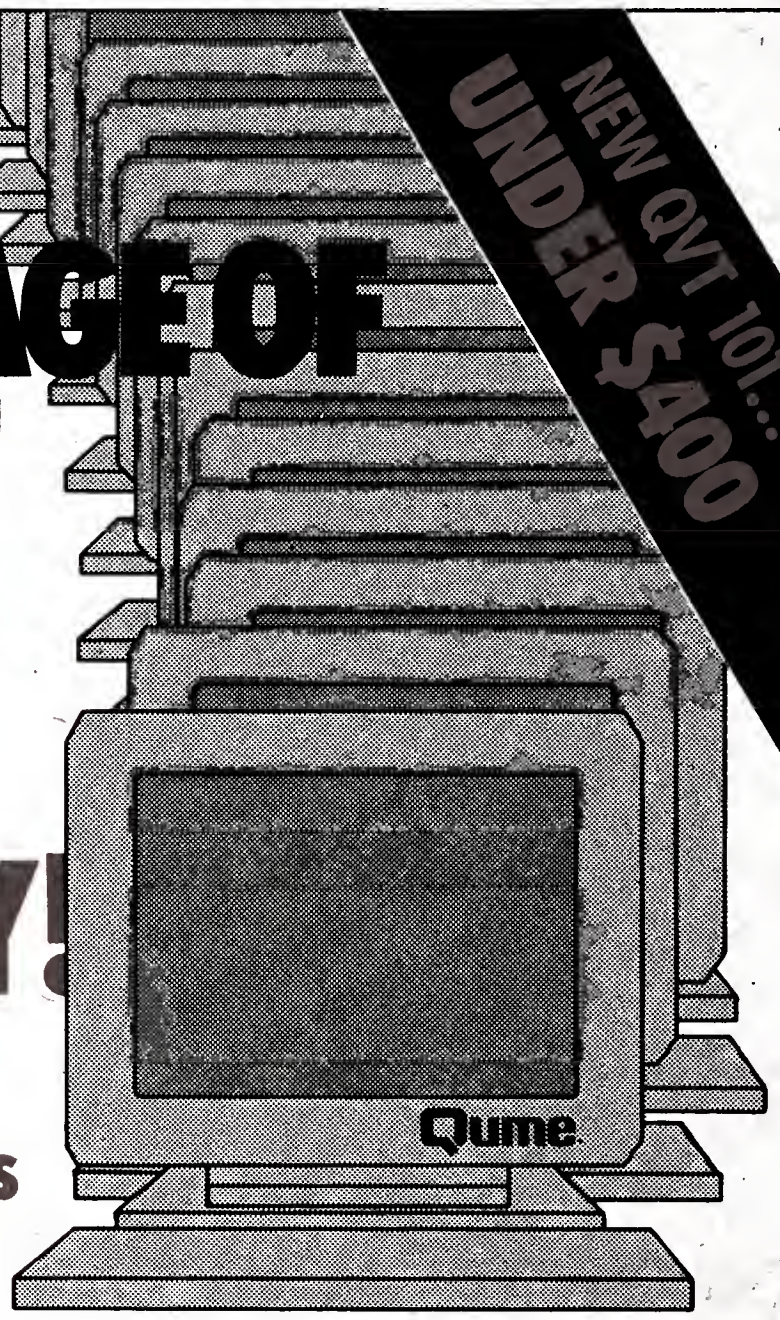
The price of the Model IV, with 640K bytes of RAM, one floppy disk drive and 10M-byte hard disk drive, was cut from $5,095 to $3,095.

Pricing on a 14-in. color monitor dropped from $695 to $545, and the color adapter card cost was lowered from $275 to $195. Cost of a 14-in. monochrome monitor was cut from $315 to $225, and the monochrome adapter card cost dropped from $225 to $145.

ITT Information Systems is located at 2041 Lundy Ave., San Jose, Calif. 95131.

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1. Name a totally integrated software package that was rated #1 by *Software Digest*. ____
2. Where can you buy an IBM PC XT or AT, AND have it installed, AND get on-site warranty for it? ____
3. Who will educate IC personnel or end-users at their site or yours? ____
4. What provides virtually any type of PC communications capability — from simple TTY to 3278/79 emulation? ____
5. What provides a micro software facility that allows you to customize a system to your specific requirements? ____
6. Who are the premier micro consultants to the *Fortune* 1350 companies? ____
7. Who has made the word hot-line obsolete, by staffing a full-service support center with computer professionals? ____
8. What is the easiest way for an IC manager to satisfy the many end-user needs in the organization? ____
9. What company's evolutionary approach to software and service (also demonstrated by NOMAD, now NOMAD2, the premier 4GL/DBMS) ensures that they'll be a major force in the micro marketplace for years to come? ____
10. Name the companies that can provide all of the above? ____

*(Turn Page Upside Down for Answers)

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MICROCOMPUTERS

C compiler enhancements out

CONCORD, Mass. — Whitesmiths, Ltd. has announced enhancements to its C compiler for personal computers based on the Intel Corp. 8086 family of microprocessors.

The Whitesmiths C compiler Version 3.0 reportedly allows applications to be ported to other central processing units through a recompiling of the source code and offers the option of an enhanced version of Pascal. Among other enhancements is support for hybrid memory models previously available only to assembler programmers, the vendor said.

More enhancements of Version 3.0 reportedly include source-level interactive debugging, with breakpointing and variable display, and full International Standards Organization Level 1 implementation of Pascal.

The Whitesmiths C compiler allows programmers to pick the memory addressing scheme best suited to each part of an application, the vendor said. Selecting or mixing memory models within an application allows an application that must manipulate a few large data objects to avoid the penalty of dealing with the many small data objects that must also be addressed.

The compiler is priced at $1,000. With optional Pascal, the cost is $1,300.

For more information, Whitesmiths is located at 97 Lowell Road, Concord, Mass. 01742.

IBM announces videotex access for Personal Computer line

RYE BROOK, N.Y. — IBM has introduced PC/Colorview, a videotex access package for IBM Personal Computers.

Priced at $105, the program is the first IBM offering to enable Personal Computer users to display videotex information stored in the text-only Ascii color format, according to the company.

PC/Colorview is said to permit users to view videotex information interactively with a host or to retrieve stored videotex information from local files resident on floppy or fixed disk.

The program uses the standard Personal Computer character set, and graphics are not supported, IBM said.

PC/Colorview reportedly provides automatic or manual dial capability for asynchronous communications and main-menu capability for five user-defined options of file names or telephone numbers.

PC/Colorview complements PC/Videotex, an existing IBM program that displays both text and graphics stored in the North American Presentation-Level Protocol Syntax format. Both programs can be used with IBM's Series/1 Videotex System, according to the company.

PC/Colorview operates on the PCjr, Personal Computer, Personal Computer XT and AT, Portable Personal Computer and 3270 Personal Computer.

More information may be obtained from IBM at 900 King St., Rye Brook, N.Y. 10573.

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SOFTWARE

■ **Esprit Computer Products, Inc. has announced multiprocessor networking software, based on Digital Research, Inc.'s Concurrent DOS operating system, for the vendor's multiuser DBS 16 supermicrocomputer.**

Concurrent DBS-NET allows the DBS 16 with three Intel Corp. 80186 processors running Concurrent DOS to support up to 12 users, expandable to 28, the vendor said.

Concurrent DBS-NET costs $9,295 in a package with a four-user Esprit DBS 16 with a 40M-byte Winchester disk drive, two 80186 processors, 1M byte of random-access memory and Concurrent DOS.

Esprit Computer Products, P.O. Box 425, Montgomeryville, Pa. 18936.

■ **Anex Technology, Inc. has upgraded Multi-DOS, an operating system enhancement to IBM's PC-DOS operating system for the IBM Personal Computer.**

Multi-DOS reportedly allows up to four workstations to access data, software and processing concurrently on a Personal Computer. Multi-DOS Release 2 offers a time-slicing algorithm, menu-driven system configuration and new parameters for fine tuning, the vendor said.

The software also is said to support random-access memory enhancements up to 2M bytes.

Multi-DOS Release 2 is included with Anex Technology's Multi-PC system, which includes an expansion chassis, cable and one workstation expansion module. Multi-PC costs $1,895.

Anex Technology, 151 N. Route 9 W., Congers, N.Y. 10920.

■ **Jyacc, Inc. has introduced its Formaker screen and window management utility software for use on the IBM Personal Computer, Texas Instruments, Inc. Professional and several minicomputers.**

Formaker is said to allow forms to be created and saved and to permit

MICROCOMPUTERS

development of a library of routines for form display, data entry and applications program access to screen data.

It reportedly allows users to draw a form directly on the screen and permits modification of screens.

Under Formaker, screen handling is removed from the program under development, the vendor said.

Formaker for personal computers is priced at $650.

The product also runs on the following minicomputers: NCR Corp.'s Tower series and Digital Equipment Corp.'s PDP-11 and VAX-11 series machines.

For those machines, the product is priced at $900.

Jyacc, 12 Rt. 17 N., Paramus, N.J. 07652.

■ **Softcraft, Inc. has announced Btrieve/N, file management and data base server software for the IBM PC Network.**

Btrieve/N can reportedly reside on one or more servers in a Personal Computer local-area network. The product is said to provide full multikey access to files, record-locking capabilities and coordination of data base access.

Btrieve/N for the PC Network requires an IBM Personal Computer AT or Personal Computer XT with PC-DOS 3.1 and IBM network hardware and software. The product is said to allow up to 24 keys per file and a maximum file size of 4G bytes. It can reportedly be used for applications development in Basic, Pascal, Cobol, C, Fortran and APL languages.

Btrieve/N is available for $595.

Softcraft, P.O. Box 9802, No. 917, Austin, Texas 78766.

■ **Terak Corp. has introduced a version of its Minn-Draft software for the IBM Personal Computer and Personal Computer XT for instruction in computer-aided design and drafting (Cadd).**

The Minn-Draft/PC package requires a minimum of 256K bytes of memory, dual 360K-byte floppy disk drives and a color or monochrome graphics card and monitor. Minn-Draft/PC also supports the IBM 8087 coprocessor and hard disk, according to the vendor.

Originated by the University of Minnesota, Minn-Draft is said to be a three-dimensional system for teaching the concepts, principles and operations of Cadd. It reportedly incorporates features of large Cadd systems for easier learning.

Included with the software is a digitizing tablet that reportedly emulates the terminal screen for 3-D graphics.

Minn-Draft/PC costs $2,995.

Terak, 14151 N. 76th St., Scottsdale, Ariz. 85260.

■ **KDS Corp. has announced KDS-Autologic software that reportedly creates expert system programs using the IBM Personal Computer. The product is said to allow expert users to teach novice users about a specified topic through the use of knowledge modules.**

According to the vendor, an expert user creates a knowledge module by entering case histories in English and poses a series of questions to the novice user in applications such as training for decision making, diagnosis and administrative management. With KDS Playback Module software, the knowledge module can reportedly be transferred to other microcomputers without recoding.

KDS-Autologic, written in assembler, is said to produce up to 16,000 rules from up to 4,096 case histories. As many as 512 conditions in any combination may be used to distinguish one case history from another, according to the vendor. It requires 512K bytes of internal memory.

The KDS-Autologic Development System, in which the user creates knowledge modules, costs $795. KDS Playback modules cost $495.

KDS, 934 Hunter Road, Wilmette, Ill. 60091.

■ **Microsoft Corp. has announced an enhanced version of its Microsoft C Compiler for the IBM Personal Computer. Version 3.0 reportedly improves the execution speed and compactness of C programs.**

A vendor spokesman said Version 3.0 is the first C compiler developed internally by Microsoft. Previous versions of the Microsoft C Compiler are reportedly easily recompiled with Version 3.0 using conversion tools provided with the package.

The compiler automatically optimizes programs when they are compiled or allows the user to select alternative optimization procedures with command line options, according to the vendor. The user can reportedly turn off optimization entirely in the early stages of program development and utilize register variables for improved performance.

The Microsoft C Compiler is said to include more than 200 runtime library routines. The compiler requires 256K bytes of random-access memory, two double-sided disk drives and Microsoft's MS-DOS Version 2.0 or higher.

The compiler costs $395. Upgrading to Version 3.0 from earlier versions costs $100.

Microsoft, Box 97200, 10700 Northup Way, Bellevue, Wash. 98009.

■ **Micro Solutions, Inc. has announced an enhancement of its Uniform utility software for users of personal computers under Digital Research, Inc.'s CP/M operating system.**

Uniform software reportedly permits users to read and write data diskettes directly from different CP/M-based personal computers and to

Continued on page 72



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Continued from page 71

initialize or reformat program or data diskettes for those machines. Enhancements offered in Version 3.0 are said to include expanded user prompts. Uniform is designed to permit businesses to use a variety of personal computers.

The software is priced at $69.95.

Micro Solutions, 125 S. Fourth St., De Kalb, Ill. 60115.

■ Information Concepts, Inc. has introduced FSP software, a full screen processor for use in software development on systems under AT&T's Unix or Microsoft Corp.'s Xenix operating systems.

FSP is said to permit developers to incorporate full screen form and menu displays and editing features into their applications. Its screen-oriented form, FSP Panel, can contain protected and unprotected fields, field initialization and validation criteria and post-response processing instructions.

The software is priced at $950, or $250 per year on an annual lease.

Information Concepts, 9th Floor, 1331 H St. N.W., Washington, D.C. 20005.

■ Unipress Software, Inc. has announced Phact-RG, a report generator for the IBM Personal Computer, Digital Equipment Corp. VAX-11 series minicomputer or computers using the Motorola, Inc. 68000 microprocessor.

Phact-RG reportedly supports multiline titles and column headings, grand totals and subtotals, page headers and footers, level breaks and both default and absolute positioning of data. It is said to run in either interactive or batch mode. The product is designed to format reports in conjunction with data bases in Unipress' existing Phact Isam record management software.

Phact-RG is priced at $165 for the Personal Computer running MS-DOS, $275 for small 68000-based machines, $420 for large 68000-based machines and $575 for VAX-11 machines running the DEC VMS or AT&T Unix operating systems.

Unipress, 2025 Lincoln Highway, Edison, N.J. 08817.

■ Genesis Microsystems Corp. has introduced its Genescope full screen debugger for debugging Intel Corp. 8086-based applications

Continued on page 73

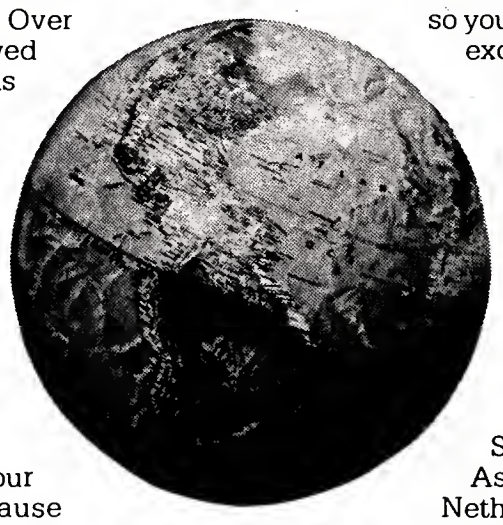
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GRID from page 65

that runs at 4.77 MHz, provides a built-in 3½-in. disk drive with 720K bytes of memory, said Alan Lefkof, Grid's vice-president of marketing. The systems are said to feature 80-char., 25-line screens with 600- by 200-pixel bit-mapped displays.

The company introduced three displays for its Gridcase family. The Gridcase I features a traditional LCD with black letters on a gray screen. The Gridcase II comes with an LCD that features blue-gray characters on a yellow screen. The Gridcase III is said to include a plasma screen.

Basic Gridcase systems come with 128K bytes of Cmos random-access memory (RAM). Also available are 256K-byte and 512K-byte versions of each system. In addition, Lefkof said, each computer in the Gridcase line can accommodate up to 512K bytes of user installable read-only memory cartridges.

Each Gridcase computer is said to include an RS-232 serial communications port and Centronics Data Communications Corp. parallel communications port. An external bus connector allows users to hook up a Gridcase portable to an IBM expansion chassis, Lefkof said. Another port allows users to connect an IBM keyboard or a 10-key keypad to the Gridcase, he said.

The Gridcase line will run Grid's operating system and its related applications software packages, Lefkof said. The company will offer the MS-DOS operating system as an option.

Included with MS-DOS is the company's PC Master/Slave software, which allows users to exchange files with an IBM Personal Computer without installing a hardware card. In addition, the firm will offer remote communications software for the Gridcase line, Lefkof said.

In standard configurations, the Gridcase I costs $2,975; the Gridcase II costs $3,150; and the Gridcase III costs $4,350. All are available now.

Grid also introduced two products for its Grid Server, which functions as the hub of Grid's local and remote networking system.

The firm announced support for MS-DOS file sharing and print spooling. With Grid's support for MS-DOS files, the Grid Server's shared disk drives appear as local devices, Lefkof said. Applications software running on Grid computers or IBM Personal Computers will be able to gain access to data files on the Grid Server using the software, the firm said.

Grid, which has priced the MS-DOS operating system at $150, will bundle the file sharing and print spooling software at no extra charge. The firm will sell the same package for Personal Computers for $100.

The company also announced Grid 3780, which will provide a communications link with host mainframes for systems on the Grid network. Grid 3780 uses IBM's Binary Synchronous Communications protocol running at 1.2K bit/sec. to 9.6K bit/sec. over leased or switched lines, he said. Files that have been downloaded to the Grid Server are automatically reformatted for use with Grid or MS-DOS software packages.

The Grid 3780 hardware and software kit, which will be priced at $3,250, includes a communications processor card and 3780 software.

Grid Systems is located at 2535 Garcia Ave., Mountain View, Calif. 94043.

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SYTEK from page 65

an overall networking scheme that includes the Localnet/20, Sytek's large-scale, general-purpose broadband network for terminals, mainframe computers, IBM Personal Computers and other personal computers, Edholm said.

Edholm suggested that while the personal computer local-area network market is driven by IBM, it is nevertheless applications oriented, with both "top-down and bottom-up installations."

Typical large-scale networking is structured from the top down, but personal computer networks frequently appear from the bottom up. First one department and then another within a large organization will see a need for a network.

With the ability to go to the corner computer store and order a network, end-user departments are becoming less dependent on central DP organizations to solve all their data processing needs.

But if networking is done from the bottom up, sooner or later the question of how the networks can be joined together arises. Broadband nets can then be seen as a solution. Based as it is on CATV technology, broadband provides the most flexible communications medium now available in tested, off-the-shelf products.

As Edholm noted, "broadband is a unique medium." A multichannel broadband system can support a de facto personal computer network standard as well as many other standard and nonstandard channels, with plenty of room for growth.

Sytek's Localnet/PC essentially provides layers one and two, the hardware and protocol layers, of the International Standards Organization's Open Systems Interconnect model. Using Localnet/PC in the PC Network, IBM essentially has provided layers three through six — the software that works with the hardware and protocols for a network system. The seventh layer, the applications layer, is not yet extensively developed, although IBM will offer some applications for that level as well.

Sytek's stated objectives are to create "a base technology to develop a family of products," an infrastructure to "develop connection products to maximize the number of devices talking to the network" and a set of applications to provide "value-added end-user services."

Potential applications include file and print serving, electronic mail, distributed data bases, time management and other personal productivity software. The approach is to provide a networking environment, since the provision of an extended number of value-added network devices and services will involve more than just Sytek.

Localnet/PC is an open network, and "Sytek is working with the third-party community to provide value-added network products," Edholm said.

Sytek claims that Localnet/PC will provide a total network system solution with a three-pronged approach: internal development, joint ventures and OEM relationships. In a practical sense, this means that third-party software developers can also produce networking software with the potential of including not only IBM micros but personal computers made by other vendors.

Continued from page 72

using the IBM Personal Computer.

Genescope is said to provide a file viewing window that allows source or listing files to be referenced during a debugging session.

It also allows users to switch from other displays to the text file with one keystroke and to let them patch programs with an on-line symbolic assembler. Assembly language mnemonics and program label names can be used instead of machine language.

A full screen debugger, Genescope displays the code as it executes. It is priced at $995.

Genesis Microsystems, 196 Castro St., Mountain View, Calif. 94041.

■ **Phoenix Computer Products Corp. has introduced Pmaker software for the management of program development. It runs on the IBM Personal Computer and compatibles.**

Pmaker is said to be similar to the AT&T Unix make utility in that it can automate any process in program development that requires repetitious steps to produce a single result. It also reads text files created by either a text editor or its built-in Make Pmaker File utility. That utility automatically generates all Pmaker commands needed to produce a program.

The software also reportedly tracks and updates every file in a program.

Pmaker is priced at $195.

Phoenix Computer Products, Suite 220, 1416 Providence Highway, Norwood, Mass. 02062.

■ **Omicron Software, a division of Engineering-Science, Inc., has announced an enhancement of its Plan/Trax project management software for the IBM Personal Computer.**

Plan/Trax 3 Version 3 reportedly allows users to rely on either the Gantt or Critical Path methods of project managment to support up to 700 tasks and track up to 10 resources. Enhancements include a summary information system and a holiday calendar.

The summary information system reportedly allows users to control overall office management functions. The holiday calendar allows users to specify up to 175 holidays to be deleted from the working schedule.

The software is priced at $795.

Omicron Software, Suite 590, 57 Executive Park S., N.E., Atlanta, Ga. 30329.



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Branch offices in major cities.

SOFTWARE from page 65

lows for autodialing without a modem. Macdesk also includes Memowriter, a miniature word processor that creates Macintosh word processor-compatible memos and letters. Macdesk costs $99.95 with Phonelink and $89.95 without it.

Desktop telecommunications

Intermatrix also introduced Computerphone, a fully integrated desktop telecommunications system for the Macintosh, the Apple Computer, Inc. Apple II and the IBM Personal Computer.

Computerphone bundles an AT&T 212A-compatible modem that provides asynchronous data communications capabilities at 300/1,200 bit/sec. transmission rates. It supports autodial, autoanswer and autospeed detect features, the vendor said.

Computerphone supports two separate telephone lines and can be used in either the single- or dual-line voice/data mode. The product's handset and base unit with monitor speaker reportedly can be mounted directly on the computer or used on a desktop.

Computerphone's software is a complete communications program with the Macdesk organizer and includes calendar, appointment alarm, memo pad and electronic filing system. It costs $399.95.

Intermatrix is located at 5547 Satsuma Ave., N. Hollywood, Calif. 91601.

Hayes announced its Please data base management software for the Macintosh. A vendor spokesman said Please can manipulate up to 1,000 char./field, 100 fields, 2,000 char./record and several million records per data base.

In addition to character fields, Please supports numeric data indicator fields. The package offers five report formats, merge capabilities, automatic dialing, on-line Help and data protection capabilities.

The product's output plans support nine levels of sorting, 30 calculated fields per report and 200 calculations. Users can design formats and output plans with the mouse pointer, and as many as 300 words, sentences, symbols or Apple Macpaint pictures in any Macintosh style or size can be used to identify groups of related data. Please will be available in the second quarter for $199.

Hayes is located at 5923 Peachtree Industrial Blvd., Norcross, Ga. 30092.

Softguard Systems, Inc. introduced an enhanced version of its Superlok software copy protection program for IBM Personal Computers and compatibles. Superlok 2.0.3 was reportedly enhanced to allow for the development of copy-protected disks that can be used over a broad range of IBM-compatible systems and third-party hard disks.

A Superlok 2.0.3 user can transfer a protected program to IBM Personal Computer hard disks and most compatible disks and between hard and floppy disks, the vendor said. Other features include simplified screen interfaces and confirmation messages, making the product easier to install and operate. Users can also customize installation prompts and error messages. A Superlok kit is priced from $225 to $2,125, depending on the number of floppy disks to be protected.

Softguard is located at Suite 201, 2840 San Tomas Expwy., Santa Clara, Calif. 95051.

Utility disk with graphics support

Execucom Systems Corp. announced a utility disk for its IFPS/Personal IBM Personal Computer-based decision support system. The Sidelight utility disk provides additional communications and graphics support for users of IFPS/Personal in a distributed micro software and hardware environment, a vendor spokesman said.

Sidelight interfaces and exchanges data with several popular spreadsheet, data base, word processing and integrated packages, including Lotus Development Corp.'s 1-2-3 and Symphony, Ashton-Tate's Dbase II and Dbase III, Micropro International Corp.'s Wordstar and Microsoft Corp.'s Multiplan.

Sidelight reportedly also supports a direct interface with any Graphics System Extension-supported graphics device. IFPS/Personal is available for the IBM Personal Computer, AT and XT. The Sidelight utility disk costs $95.

Execucom also announced that IFPS/Personal is now available for Hewlett-Packard Co.'s Touchscreen personal computer at $1,500.

Execucom is located at 3410 Far West Blvd., Austin, Texas 78731.

GEMS from page 65

graphics and can edit graphics and charts produced by GEM Graph and GEM Wordchart, the firm said.

GEM Write is a word processing program designed by Lifetree Software, Inc. Users will be able to merge graphics created in other GEM applications into GEM Write documents, a Digital Research spokesman said.

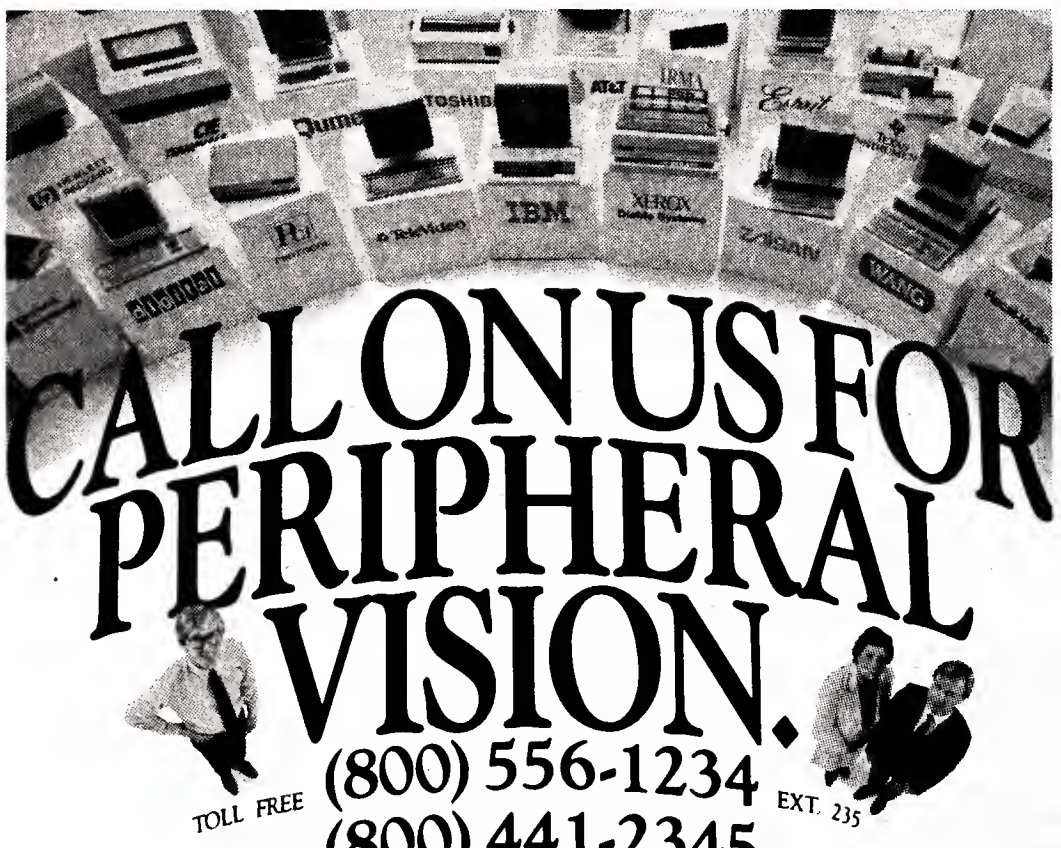
The GEM Graph program is said to offer users a choice between a variety of chart templates — pie, line, bar and map. Symbols drawn with GEM Draw can be merged into charts, the company said.

GEM Wordchart was designed to help users produce text charts. It is said to include a selection of templates for quotations, tables, bullets and outlines. Artwork developed using GEM Draw reportedly can be added to GEM Wordchart files.

GEM Desktop and GEM Draw will be available this month. GEM Desktop will cost $49.95. GEM Draw will carry an introductory price of $149; the firm plans to raise the price to $249 in September.

According to the company, the GEM Collection, which includes the Desktop, Write and Paint software, will cost $199 and will be released in mid-June. Users who buy the Desktop will receive a coupon that will allow them to purchase Write and Paint for $99.95 until Aug. 31. Both GEM Wordchart and GEM Graph will ship by July 1. Wordchart will cost $149, and Graph will cost $199.

Digital Research can be reached at Box DRI, Monterey, Calif. 93942.



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SPERRY



COMMUNICATIONS



DATA STREAM
John Dix
CW Senior Editor

AT&T to boost service costs?

Renowned industry consultant and lecturer Harry Newton recently received in the mail a plain white envelope that contained a copy of an executive internal memo from AT&T Communications.

The missive, penned by Gus Blanchard, AT&T Communication's vice-president of custom services, outlined problems the company is having installing and maintaining special services, such as leased, Wats and toll-free lines, and painted a gloomy picture of prospects for improving the problem.

Written as an update on the state of service provisioning for Randall Tobias, the company's chief executive officer since Feb. 1, the memo was circulated electronically to a number of employees with little heed paid to its secrecy, a company spokesman admitted.

One copy ended up in the mailbox of *Teleconnect*, an industry magazine published by Newton. He ran a copy of the memo in his April issue, prefacing it with the question, "Is it a 'leak' or a 'plant?' " If the memo was planted, Newton reasoned, AT&T may be trying to put pressure on the Federal Communications Commission, the divested Bell operating companies and perhaps AT&T management.

The gist of the memo is that Blanchard believes AT&T does not currently recover the cost of installing and maintaining special services and that, in the future, efforts to recover these costs will drive up end-user fees. It also indicated that predivestiture installation periods for these types of services are unrealistic and costly.

Here are some highlights from Blanchard's memo:

- "Although prior to divestiture the provisioning process delivered to our customers what they wanted — short delivery intervals, dependable due dates and low price — it was terribly inefficient and extremely costly for the [divested operating companies] and [the former Long Lines division]."
- "There was never any suggestion that the tariffed, one-time, nonrecurring costs of installing, moving or disconnecting such services even remotely covered actual costs."
- "A general willingness on the part of [the divested Bell operating companies and the former Long Lines division] to put on-time delivery of services before internal expense or efficiency concerns gave our customers what they wanted at a price which did not — in my opinion — begin to accurately reflect our provisioning costs."
- "I believe the end result [of access interfaces and ordering procedures] to the customer will be higher costs and longer intervals than [they] experienced predivestiture."
- "The recently filed private-line tariffs, by allowing the customer to order

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WIRE TAP/DANIEL MINOLI

Scenario for network backup

Adapting communications systems to switch between a primary host site and backup facilities when a disaster strikes is relatively straightforward and economical when state-of-the-art network technologies such as packet switching, two-way direct broadcast satellites and digital termination systems are used.

Planning for disaster recovery where traditional IBM Binary Synchronous Communications or Systems Network Architecture multidrop teleprocessing networks are used requires special attention.

Besides long-distance networking, the disaster recovery plan must accommodate communications within and between buildings that may be supported by local networks, local distribution networks with limited-distance modems or bypass facilities.

A desirable characteristic of disaster recovery plans is low risk. One low-risk approach may involve the use of central office multiplexing as provided by local telephone companies. With this scenario, a user's primary host site is connected to an alternate site through a telephone company switching center using high-speed communications lines.

Central office multiplexing reduces points of vulnerability that are created when in-house communications equipment is used to back up a processor site. As an example, dependence on a private branch exchange to switch communications lines from a processor located in the same room to a backup site creates a secondary vulnerability instead of eliminating the risk.

Also, with central office multiplexing, the maintenance and availability of the equipment destined for use in disasters — in this case, the telephone company switches — rests on the shoulders of a knowledgeable third party.

Minoli is an associate vice-president, systems planning and engineering, of Prudential-Bache Securities in New York.

See **MINOLI** page 79

Rolm offers tools for PBXs

SANTA CLARA, Calif. — Rolm Corp. recently announced call routing and call restriction software for its CBX II and VSCBX private branch exchanges.

The features, which are part of Rolm's Integrated Call Management, include support of equal-access dialing options, 10-digit call screening and the ability to use dial-up circuits for tie-line-like applications.

With Route Optimization II, users are said to be able to use the 10XXX dialing option created with equal access to route calls over different long-distance carriers. As local telephone companies upgrade for equal access, they are asking customers to choose a primary long-distance carrier that will be accessed as AT&T is today — by dialing a single digit. Carriers other than the primary supplier can be accessed by dialing 10 and a three-digit carrier specification code.

Route Optimization II is said to enable users to select carriers manually by keying in access codes or by having the switch insert the code automatically. The package consolidates the capabilities of least-cost routing, queuing and toll restriction in one system, Rolm reported. The software costs $1,200 for the VSCBX, $6,000 for CBX II Model 8000 and $22,000 for the CBX II 9000.

Rolm's new Call Screening software is said to enable call restriction by seven- or 10-digit telephone numbers. This capabili-

See **ROLM** page 78

Firms to test cellular data communications

BASKING RIDGE, N.J. — Are cellular mobile telephone systems practical for data communications? Bell Atlantic Mobile Systems, Inc. and AT&T are undertaking a three-month trial to determine the answer to that question.

At the end of April, 50 customers located in the Washington, D.C. area will begin testing the service from their cars. These customers represent a cross-section of businesses including banking, insurance, media, telecommunications, manufacturing, hotel, professional services and government companies.

Bell Atlantic will provide the mobile service, and AT&T will supply the cellular telephones, special modems, the switching equipment for encrypted voice and data communications and, in some cases, portable computers from Data General Corp. or Hewlett-Packard Co.

The trial will test how well the equipment deals with fading, a condition that occurs when a car moves away from a cellular broadcasting tower that is said to

See **TEST** page 78

AT&T seeks to expand DDS to UK market

MORRIS PLAINS, N.J. — AT&T has filed a proposal with the Federal Communications Commission that would expand the telephone company's international Dataphone Digital Service (DDS) to the UK.

The service would connect AT&T's DDS service with British Telecom International's Kilostream service. The expanded international DDS would allow businesses to transmit data 24 hours a day, seven days a week at 2,400, 4.8K, 9.6K and 56K bit/sec.

International DDS, introduced in 1974, is available in 104 U.S. cities and Canada.

AT&T proposed that the service become available on May 18. If approved, a user would receive monthly service charges from AT&T and British Telecom International. AT&T's monthly rate would be $1,800 for a 2,400 bit/sec. channel, $2,400 for a 4.8K bit/sec. channel, $3,000 for a 9.6K bit/sec. channel and $12,000 for a 56K bit/sec. channel.

More information is available from AT&T Communications, International Department, Atrium One, 202 Johnson Road, Morris Plains, N.J. 07950.

- Tymnet and Satellite Technology Management have signed a joint venture agreement to offer a satellite network service/**78**
- Comdesign has announced hardware and software products for interconnecting local- and wide-area networks/**78**
- AT&T has added audio and audiographic capabilities to Alliance, its teleconferencing bridging system/**79**

Firms pen satellite pact

SAN JOSE, Calif. — Tymnet, Inc. and Satellite Technology Management (STM), Inc. have signed a joint venture agreement to offer Tymstar, a public satellite network service.

Tymstar will be a two-way service using micro earth stations designed to replace leased lines, Tymnet said. The system, based on STM's Starmux technology, will be a full-duplex digital communications service featuring a packet-oriented, time-division multiple-access design.

A Tymnet spokesman said that the earth stations, which will measure approximately six feet in diameter each, will have between four and 24 ports. Initially, the product will support asynchronous, X.25 and IBM Synchronous Data Link Control protocols. The earth stations will feature transmission speeds up to 96K bit/sec., and the receive capacity will range up to 15M bit/sec.

The agreement stipulates that STM will supply technical support, and Tymnet will market the service, distribute earth stations and support customers. The system should be available at the beginning of 1986. The first master hub will be placed in Southern California; additional hubs in the Midwest and East are planned.

Tymnet estimated that prices for a two-way earth station will start at $25,000, and one-way station prices will begin at $5,000.

Tymnet is located at 2710 Orchard Pkwy., San Jose, Calif. 95134.

ROLM from page 77

ty enables telecommunications managers to block calls to certain numbers, such as time and weather reports and dial-it services. The feature costs $1,000 on the VSCBX, $3,000 on the CBX II 8000 and $6,000 on the CBX II 9000.

For organizations with multiple business locations, Rolmnet II includes a capability known as Virtual Private Lines. This feature is said to enable dial-up circuits to be used in lieu of tie lines. It provides direct called-party access without Direct Inward Dialing.

Rolmnet II is initially available on the VSCBX for $6,000 and on the CBX II 8000 for $12,000. The company said the feature will be available on the CBX II 9000 in the future.

Shipments of the software will begin in June.

More information is available from Rolm at 4900 Old Ironside Drive, Santa Clara, Calif. 95054.

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be nearly imperceptible in voice conversation but which can cause errors in data transmission. The test will also see how well the equipment for data communications can maintain connections when the signal is handed from one geographic broadcasting cell to another as the user travels.

Customers will reportedly be able to transmit data at speeds of 300, 1,200 and 2,400 bit/sec.

Bell Atlantic Mobile Systems is located at 180 Mount Airy Road, Basking Ridge, N.J. 07920.

Futurecom 2000 components released

GOLETA, Calif. — Comdesign, Inc. has announced the Futurecom 2000 Integrated Area Network hardware and software products for interconnecting local- and wide-area networks in a single net. Futurecom 2000 supports Ethernet networks and RS-232 interfaces.

According to a spokesman, Futurecom 2000 is based on Comdesign's Compatible Communications Architecture protocol, which utilizes features of several different protocols to provide network integration.

Futurecom's components include:

■ The LS-2000 Local Server concentrates data traffic from as many as 32 devices onto an Ethernet local-area network.

■ The RS-2000 Remote Server connects up to 32 user network channels with four composite RS-232 concentrated links to support distributed devices.

■ The NS-2000 Network Server is a gateway node bridging normally incompatible transmission media. An NS-2000 on each node group provides remote access from local network-based resources residing in physically separate networks such as CPU ports, terminals, printers and data collection devices. The NS-2000 functions as an Ethernet controller with one Ethernet link and up to four RS-232 wide-area links.

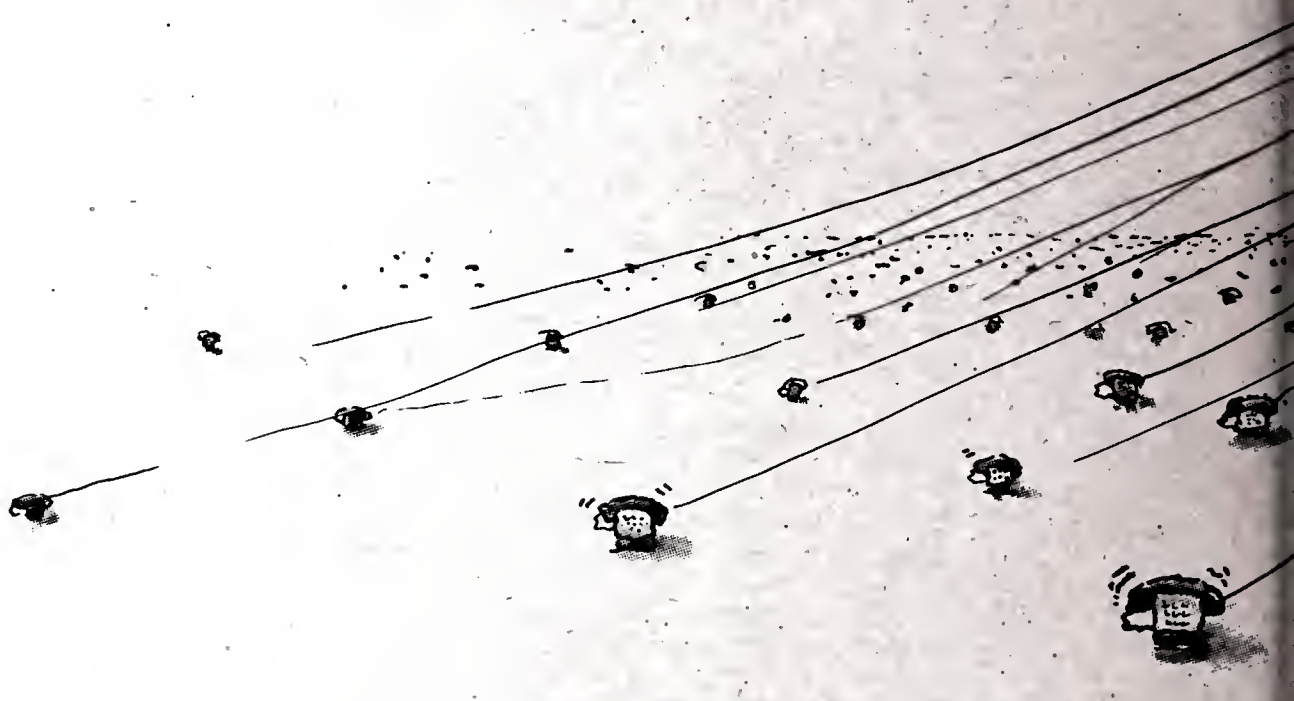
Any of the Futurecom components can function independently, and the network can be configured and monitored from any user channel on any Futurecom node, with password authorization to the supervisory control logic.

Security is provided by programmable resource access and password protection. Futurecom supports data transfer speeds of up to 19.2K bit/sec. on RS-232 links and asynchronous speeds from 300 to 9.6K bit/sec.

The Futurecom product line is scheduled to ship in production quantities in the third quarter of 1985. Prices are as follows: NS-2000, $5,800; LS-2000, $4,300 to $7,700; and RS-2000 $3,800 to $10,300.

Comdesign is located at 751 S. Kellogg Ave., Goleta, Calif. 93117.

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AT&T adds audiographics, audio capabilities to Alliance

MORRIS PLAINS, N.J. — AT&T has added audio and audiographic capabilities to Alliance, its teleconferencing bridging system that is said to be able to connect 59 domestic or 134 worldwide locations.

The service enables users to place audio or audiographic calls. The audiographic capability enables graphics equipment to transmit data or graphics images at speeds up to 4.8K bit/sec. simultaneously to a number of locations.

With a push-button telephone, customers can establish an Alliance conference. The customer or an operator can then connect the calls to Alliance bridges located in Chicago, Dallas, Los Angeles and White Plains, N.Y.

Originators of conference calls pay long-distance charges for the call to the nearest bridge. If the call is established by an attendant, there is a $3 charge for each location.

International Alliance calls are billed at the same rate as international calls from the bridge.

Additional information on the Alliance service is available from AT&T Communications International, which is located at Atrium One, 202 Johnson Road, Morris Plains, N.J. 07950.

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Typically, the facilities used between the telephone company central office switch and the primary and backup sites will be T1 digital pipes.

Once that bridge has been established, the problem becomes how to route communications traffic from the afflicted primary site out to the switch so that the traffic may be directed to the backup facility.

Three types of links need rerouting

There are three major types of links that must be rerouted: links between in-house controllers and processors; links between processors; and incoming multidrop lines used to support geographically dispersed locations.

In-house controllers crucial to the business should be relocated in user areas rather than in the processor room. This can be achieved using limited-distance modems and other patches. An A-B switch is then added to each controller.

Under normal operating conditions, the switch provides a connection to the primary processor, but when a disaster occurs, the switch can be thrown to connect the controller to the T1 facility serving the backup site through the local central office.

Computer-to-computer links can be handled by engineering a three-point circuit, the third leg of which is either brought on-line by the telephone company at the time of disaster or is packed into the T1 pipe.

The switching of multidrop lines from the primary site to the backup location is most efficiently handled using a local telephone company option called 3DY. This is a central office switch-bridging technology that permits dynamic merging of multiple lines into fewer lines.

For example, instead of having to switch over all multidrop lines to the backup site, 3DY enables multidrop lines to be merged while continuing to provide support to each remote location.

Each line would support more drops — perhaps one for two or one for three — and service would be degraded, but the rationale is to pack the total number of drop sites into the smallest number of circuits consistent with the channel capacity on the long-haul pipes, the affordable number of duplicate modems at the backup site and the permissible level of service.

Of course, switching all multidrop lines to the backup site on a one-for-one basis is also possible, but expensive.

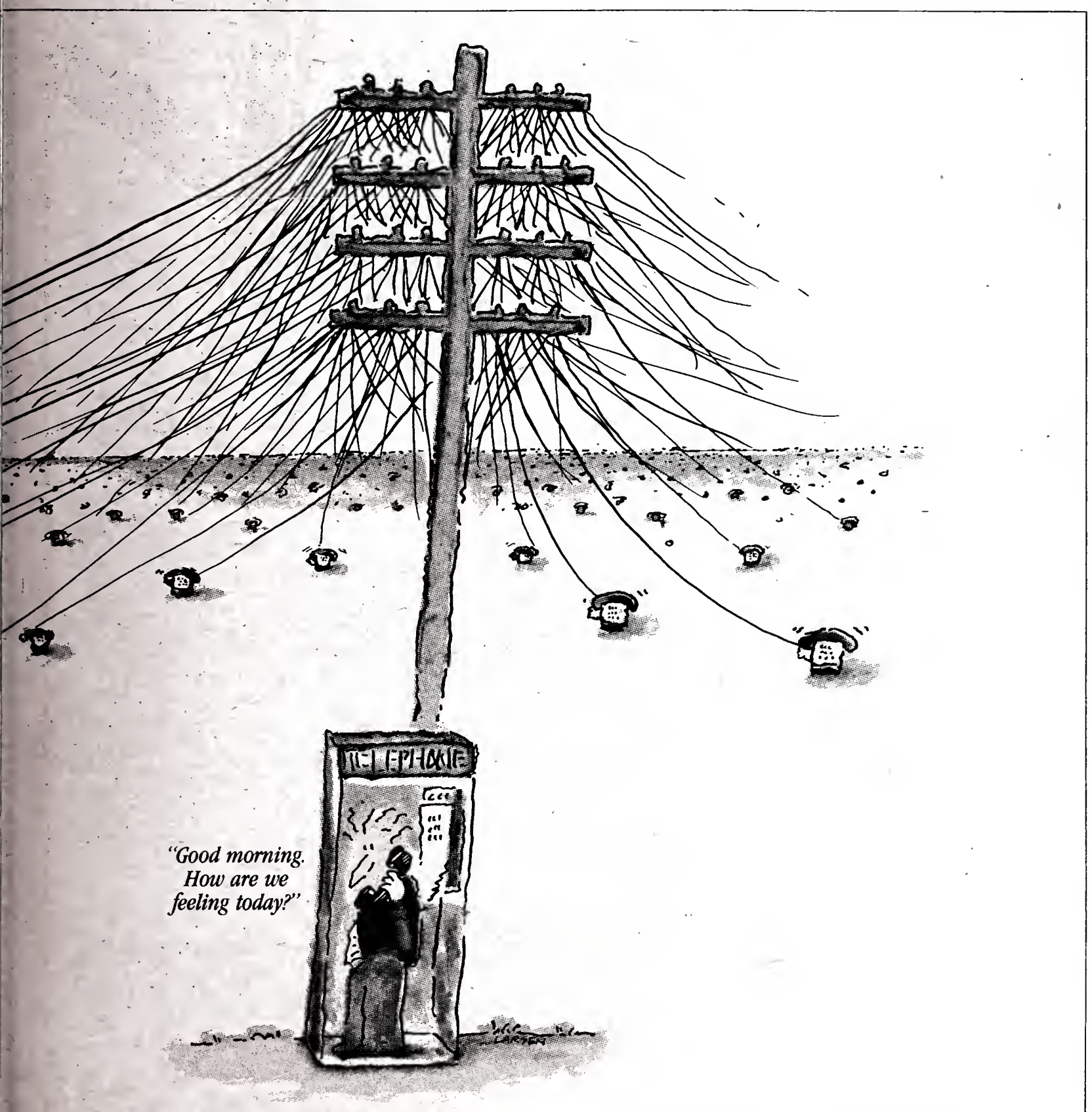
Where the number of multidrops is reduced by the merge, a subset of the dispersed controllers must be regenerated with the appropriate address. This can be done locally at recovery time or, where dual port controllers are used, remotely from the second port.

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his own access from the [local exchange carrier] or provide his access by other means, have created additional layers of complexity, which must surely add to the cost of the provisioning process for the foreseeable future."

■ "Today we alone bear the single managerial and financial burden of coordinating the activities of all [local exchange carriers] involved in providing access. We — rather than the customer — accept each access line when our local people and the [local operating company] can install it, and we begin receiving a bill from the [local operating company] when that happens — even if the entire circuit is not working and therefore is not bringing us revenue from the customer."

■ "[AT&T Communications] does not now possess the tools to accurately tie costs to such customer-valued attributes as intervals and on-time reliability. As the would-be value-added end-to-end provider [of custom services], we are squarely in the middle and faced with the extremely difficult and dangerous task of 'weaning' our customers away from unrealistic prices and intervals."



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SYSTEMS & PERIPHERALS

Honeywell releases Infonow for DPS 6

Videotex system allows graphics, text transfer

By Donna Raimondi
CW Staff

WALTHAM, Mass. — Honeywell, Inc. has unwrapped a turnkey videotex system based on its DPS 6 minicomputer family. The Infonow Videotex System uses the French Teletel, or Antiope, information exchange protocol to allow transmission of graphics as well as text.

The videotex system offers nontechnical staff access to information that could include company's price lists, product catalogs, job postings, internal purchase orders, company policies, benefit plans, engineering standards and directories, the vendor said.

A typical 500-user system would cost approximately $500,000. The system includes a central DPS 6 running under Honeywell's Gcos 6 MOD 400 operating system, with different models ranging from $93,000 to $173,000. Also included is an Information Provider workstation priced at $4,635, a System Administrator terminal priced at $795 for a Honeywell VIP7201 and $1,900 for a VIP7301 and Telic-Alcatel's monochrome Minitel terminals priced at $650 each for users. A printer is required for system statistics; the prices are $3,360 for a 160 char./sec. dot matrix printer and $11,500 for a 300 line/min printer.

The Honeywell Microsystem PC, IBM Personal Computer and Personal Computer XT can be equipped with a Micrologic, Inc. VT-Link adapter board, priced at $720, and terminal emulation software, priced at $25, that comes on a 5¼-in. floppy disk, the vendor said, to allow them to function as Minitel terminals with a color display.

Access public data networks

The adapter board does not affect the personal computer's existing capabilities, the vendor said. When personal computers are linked to the system, they can access public data networks such as The Source, Dow Jones & Co. and Nexis Service. The Minitel terminals cannot access such data networks because the public data bases are Ascii-based, 80-char., formatted services, and Minitel terminals are Antiope-based, 40-char. screens, the vendor said.

The videotex system requires a staff member to load information into the information base, organize it logically, keep it current and determine which mnemonics and keywords may be used for access. Such people typically are non-DP employees and need not know operating systems, data bases or command languages, the vendor said.

A system administrator is responsible for central system functions, such as user registration, password assignment, statistics printing and disk backup. System administrators require little or no data processing background, the vendor said.

Users may retrieve and display pages of information but cannot alter the contents of a page. A series of menu displays and multiple choice selections guide the user, and mnemonic codes allow the user to enter abbreviated forms of the menu selections to bypass the menu, the vendor said. The system has built-in tutorial screens. Single key words and key words linked with AND, OR and NOT allow the user to search for information. The system also provides electronic messaging capabilities, the vendor said.

An optional Ordernow software applications package allows customer orders to be entered into the system and stored for later transfer to the main data processing system. This option is available for an ini-

See **VIDEOTEX** page 88

■ Bell & Howell unwrapped a computer output microfilm system for Honeywell equipment that is capable of supporting concurrent paper and microfilm printing from the same source data file/**86**

INSIDE

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Power Supplies/**82**
Board-Level Devices/**86**
Auxiliary Equipment/**86**

Soemi bridges Multibus, 4361

HILLSBORO, Ore. — Intel Corp. has announced its ISBC 561 Soemi Controller Board — a dedicated I/O controller on a standard Intel Multibus I board — which serves as a bridge between Intel Multibus systems and the IBM 4361 computer.

The board permits use of a 4361 in applications such as real-time process control, computer-aided engineering and manufacturing, factory automation, voice synthesis and recognition, laboratory automation and measurement, the vendor said. It includes a 5-MHz Intel 8086 microprocessor, an 8-MHz microcontroller, 16K

See **BOARD** page 88

NCR unveils 6480 laser printer

By Donna Raimondi
CW Staff

DAYTON, Ohio — NCR Corp. has released its NCR 6480 laser printer, which features a printing speed of 103 page/min on 8½-in. fanfold paper and a dot matrix density of 57,600 dot/sq in. The printer is available for use with the NCR VRX operating system on NCR V-8575 II, V-8585 II and V-8595 II mainframe processors and costs $210,430 for a unit with four character fonts.

The 6480 uses the cold-fusion print adhesion process in which a chemical agent is used to fuse the toner onto the paper, as opposed to a heat-fusion process. The cold-fusion process is said to make pregummed paper labels and forms with cellophane address windows that are less likely to wrinkle or stick during printing.

Optional memory expansion units cost $6,600 each. One memory expansion unit is needed to go from four to 16 fonts, another is needed to go from 16 to 32 fonts. Above 32 fonts, one memory expansion is needed for every 12 additional fonts. As many as 64 character sets can be loaded into the 6480. Fonts added to the basic four cost $150 each.

Users are said to be able to custom design simple graphics and character sets, modify characters within a set and create their own custom forms.

More information can be obtained from NCR, V Systems, U.S. Data Processing Group, Dayton, Ohio 45479.

Recent CPU releases reflect similar technology



HARD TALK
Tom Henkel
CW Senior Editor

Since February, IBM, National Advanced Systems Corp. (NAS), Honeywell, Inc. and Burroughs Corp. have each announced high-end mainframes. Although the architectures employed by the four vendors are different, the product announcements bear some striking similarities. For example, the systems announced by all four firms offer about twice the performance and occupy approximately 30% to 40% less floor space than their respective predecessors.

This is hardly a coincidence. Researchers from IBM, Burroughs, Hitachi Ltd. — which makes NAS' CPUs — and Honeywell's CPU supplier NEC Corp. all went to work about five years ago determined to develop successors to their top-end products. What is interesting is that all four manufacturers managed to come up with processors on the same basic technological level.

In each case, the dramatic performance and floor space improvements on the newly announced processors rest, in large part, with the density of the circuits used in them. Howard Dicken, president of DM Data, Inc., a research company in Scottsdale, Ariz., noted that every 10% of a micron reduction in the circuit-packaging process translates into a squaring of the circuit-packing density and performance of the chips. Consequently, vendors can develop CPUs that are smaller, more reliable and less expensive to manufacture.

These developments in circuit packaging are quite interesting considering that a few years ago many industry watchers said they believed that to develop processors capable of internal performance in the 40

See **CPU** page 86

More channels, faster exchange mark IBM's 4381

RYE BROOK, N.Y. — IBM has expanded from eight to 12 the number of channels on its 4381 Model Group 3 mainframe that can transfer data at 3M byte/sec. This, the vendor said, allows the 4381 Model Group 3 to use more top-end IBM peripherals.

In addition, IBM said all 4381 Model Group 3 channels that previously could exchange data at 1M byte/sec. can now operate at 2M byte/sec.

Both no-charge features will be installed on all 4381 Model Group 3 processors shipped after April 3. A field-installable engineering change for currently installed systems will also be available this month.

More information is available at any IBM sales office.

SYSTEMS & PERIPHERALS

PROCESSORS

■ **Applied Digital Data Systems, Inc. has announced its Mentor 5500 business computer system, which is based on an enhanced version of Pick Systems' Pick operating system.**

The 5500 provides from 512K bytes to 1.5M bytes of memory and supports up to four 167M-byte, 8-in. disk drives, with ½-in. magnetic tape (16K/32K bit/in.) backup. The system has four Centronics Data Computer Corp.-type parallel printer ports and can support up to 64 terminal ports.

The system is said to provide 70% improvement in speed over the the firm's 4000EP. This is because the 5500's terminal controller allows offloading of I/O tasks, thus freeing the CPU for processing, the vendor said.

Typical configurations of Mentor 5500, including terminals and printers, range from $80,000 to $150,000.

Applied Digital Data Systems, 100 Marcus Blvd., Hauppauge, N.Y. 11788.

DATA STORAGE

■ **Megatape Corp. has announced that a cache option incorporating an error-correction capability is now available for use with its 300M- and 500M-byte streamers.**

Both the full-wide and half-wide versions of Megatape Model MT-500 and MT-300 cartridge tape drives can be supplied with the 128K-byte cache buffer.

Error-correction coding is said to be an integral part of the cache. The 128K-byte cache buffer eliminates interfacing problems and permit use of Megatape drives with the standard magnetic tape drives that are available with the various computer operating systems, according to the vendor.

Full-wide drives with cache having 300M- and 500M-byte capacity are priced at $4,075 and $4,725, respectively, in OEM quantities. Half-wide versions cost $4,725 and $4,925 respectively, for the same capacities.

Megatape, P.O. Box 317, 1041 Hamilton Road, Duarte, Calif. 91010.

TERMINALS

■ **Amtron Corp. has announced the CD1920 series, a 19-in. color graphics display monitor series for OEMs that can be interfaced to graphics generators by vendor customization of the OEM's horizontal and vertical synchronization signals requirements.**

The CD1920 series' features include 150-MHz bandwidth, automatic vertical synchronization up to 180 Hz and 0.31mm dot pitch, resulting in a display of 1,280- by 1,024-dot resolution. Its color and paint schemes can be customized for OEMs. The series, available with a tilt-and-swivel base, meets all Underwriters Labs and Canadian Standards Association standards, the vendor said.

The models are priced from $2,800 to $3,800 for quantities from 200 to 500.

Amtron, 2260 De La Cruz Blvd., Santa Clara, Calif. 95050

POWER SUPPLIES

■ **Basic Measuring Instruments has released its Model 4800 Graphic Environmental Monitor, which supplements written description of voltage and disturbance data with a picture.**

The 4800 monitors common AC power sources, including single-phase, three-phase delta and three-phase wye. It monitors 50Hz, 60Hz or 400Hz lines without hardware changes. With external probes, users can configure the eight environmental channels that handle temperature, humidity shock, vibration, particulates, contact closure and other parameters.

The picture of the disturbance is printed on thermal paper. The report format includes site, time, date and other user-determined information. Prices for the 4800 Graphic Environmental Monitor start at $7,200; shipments will begin in May.

Basic Measuring Instruments, 402 Lincoln Centre Drive, Foster City, Calif. 94404.

■ **Sola, a unit of General Signal, has introduced its intermediate-model power line monitor, including printer, that plugs into a wall outlet to analyze line power quality as it comes into a room.**

The unit can determine power protection requirements of potential electronic installation sites or can check existing installations to ascertain whether electronic malfunctions are being caused by incoming power. The GS2X plugs into any electrical outlet. It features user-adjustable disturbance thresholds and detailed readouts of disturbance values.

The unit's clock/calendar is supported by rechargeable batteries that provide a minimum of two weeks of power when line power is absent, the vendor said.

The intermediate-model power line monitor costs $1,595.

Sola, 1717 Busse Road, Elk Grove Village, Ill. 60007.

■ **SL Waber, a division of SL Industries, Inc., has introduced its Linegard 300 line of uninterruptible power supplies that protect computers ranging in size from microcomputers to minicomputers.**

The Linegard 300 is a continuous duty power supply designed to protect computer data loads in the event of irregular voltage conditions, blackouts, voltage surges and sags and noise.

Initial models include a 300-kVA unit for $995 that protects micros and small minis and a 600-kVA unit for $1,495 for stand-alone or networked minis.

SL Waber, 300 Harvard Ave., Westville, N.J. 08093.

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USER FRIENDLY?

If logging on to online systems is a threatening experience for your users, you should know about CL/MENU™. CL/MENU makes online systems less intimidating, even to the novice or casual user. It replaces the traditional "Welcome to Our Network" screen with a menu, showing applications and their status (available or unavailable). If an application is unavailable, CL/MENU can be used to tell the users *why* it is unavailable and when it will be available. Requests for automatic logon or notification *when* an application becomes available can also be queued within CL/MENU.

CL/MENU includes an "Electronic Bulletin Board", with a "Hot News" area on the menu screen and a browsable Bulletin display. Both may be viewed without logging on to an application.

The most important benefit of CL/MENU is better user communication. If an application becomes unavailable while in use, the user automatically returns to CL/MENU rather than the "Welcome" screen. There, the DP staff might use the "Hot News" to post a message, such as "Order Entry temporarily out of service due to hardware problem – back up at 10:15 am". Without CL/MENU, the application would simply disappear, probably causing a flood of Help Desk calls and annoying the users.

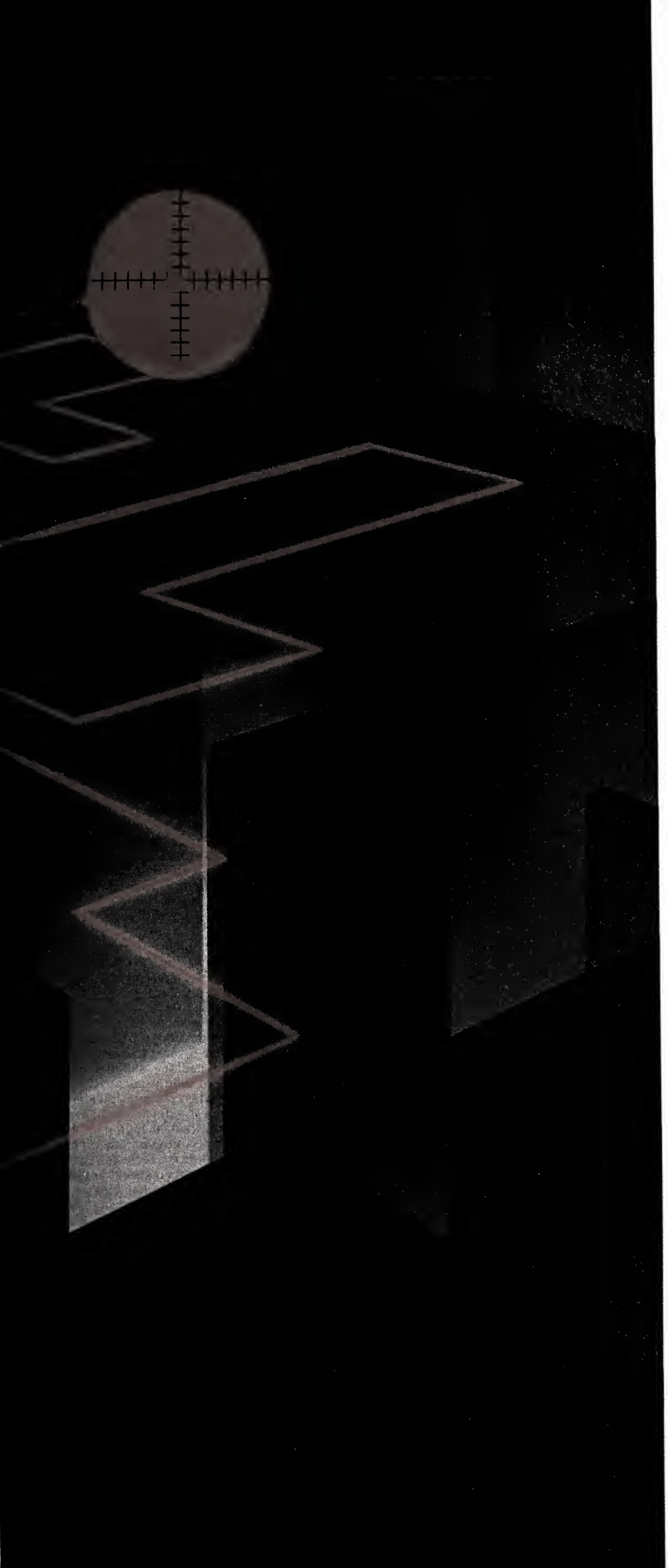
CL/MENU executes without system modification in an MVS/370 or MVS/XA environment, under all versions and releases of ACF/VTAM. Any 3270-family or compatible display with at least 80 columns is supported in single or multi-domain networks. Since CL/MENU uses standard operating system and ACF/VTAM facilities, the installation and customization process is simple and straightforward.

In short, CL/MENU makes using online systems simpler and more convenient, thus less intimidating. The result is better customer service, reduced Help Desk traffic, and a better image for your data center. For more information on CL/MENU, call (213) 207-1400.

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Bell & Howell microfilm division unwraps shared-file COM system

IRVINE, Calif. — Bell & Howell Co.'s computer output microfilm (COM) division has announced a COM system capable of supporting concurrent paper and microfilm printing from the same source data file.

The 6400H COM printer provides on-line microfilm output through a Honeywell, Inc. Level 6 minicomputer in conjunction with paper output from a Honeywell Page Printer, Bell & Howell said.

A paper document can be produced from the page printer while a microfilm version of the same data is generated on the 6400H COM printer.

The system is also said to access different files at the same time so that one job can run on fiche while a different file is printing on paper. Printing is executed at a speed of 26K line/min, according to the vendor.

The system is available in either a cut-fiche dry system for $93,500 or as an archival processing scroll system for $77,500.

The 6400H can operate off-line directly from the Level 6 minicomputer or through the Level 6 to a Honeywell mainframe in real-time, on-line mode.

More information on the system is available from Bell & Howell, which is located at 16691 Hale Ave., Irvine, Calif. 92714.

BOARD-LEVEL DEVICES

■ Hewlett-Packard Co. has released its HP 64340A hardware logic analyzer for software designers. The unit allows users to make specific real-time measurements and to display the results in terms of source code.

The analyzer is housed on three circuit boards that are installed with a host emulator in an HP 64100A development station. The HP 64340A — a subset of the HP 64000 software design center — allows software designers to work on applications that are real-time dependent, the vendor said. The analyzer offers Enable/Disable functions for troubleshooting and evaluating operating systems written in high-level languages.

Six measurements allow the designer to trace modules, data flow, statements and variables and to count statements and time modules.

The unit costs $11,000, and the software — available for Motorola, Inc.'s 68000 and 68010 and Intel Corp. 80186 and 80188 microprocessors — is an additional $1,000.

HP, 1820 Embarcadero Road, Palo Alto, Calif. 94303.

AUXILIARY EQUIPMENT

■ Intermec Corp. has released its 9165 System Control Unit, which lets IBM mainframe users implement Intermec bar code equipment and Ascii CRT terminals and print-

Continued on page 88

To get the world's most advanced 50 CPS daisywheel printer, you'll have to pay less.

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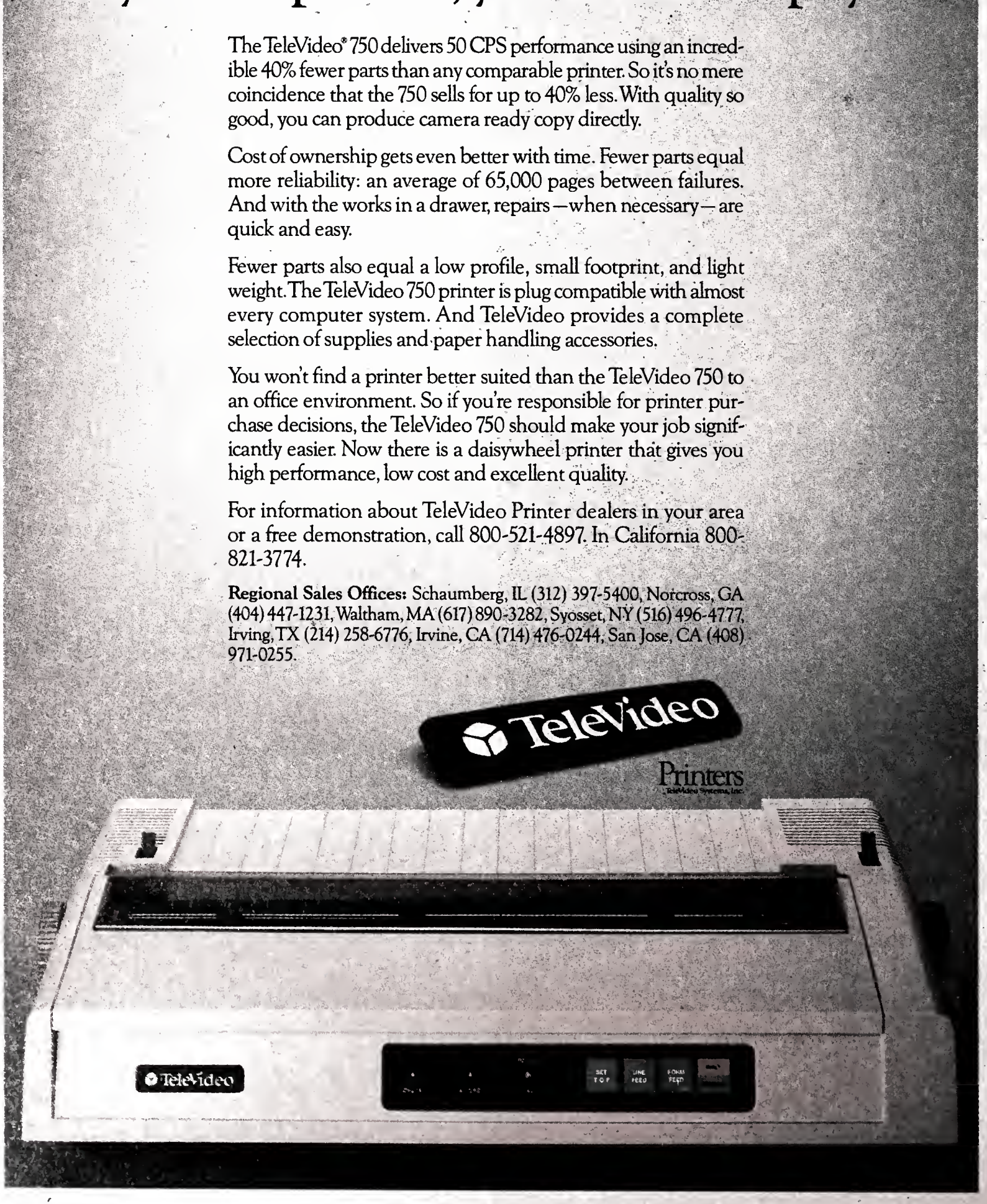
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CPU from page 81

to 50 million instructions per second (Mips) range, most mainframe manufacturers would have to use something besides the traditional bipolar silicon circuit substrates. But with better packaging, researchers now believe that bipolar silicon still has about 10 years of life left in it before another substrate will have to be used.

It is a long-standing tradition that after IBM announces a high-end mainframe, the rest of the industry makes a hurry-up effort to catch up. But in the latest round of mainframe announcements, it looks like the opposite has happened. Judging from how quickly Hitachi, NEC and Burroughs reacted to IBM's 3090 announcement, it looks like all three firms had already developed processors and were waiting for IBM to tip its hand before making the formal announcements.

The holdouts

Three holdouts have yet to unveil answers to the 3090: Amdahl Corp., which gets its hardware from Fujitsu Ltd.; Sperry Corp. and NCR Corp. Amdahl is officially contending that its 580 series processors match IBM's 3090 Model 200 in performance. But now that Hitachi has unveiled its top-end machine, the pressure is on Fujitsu to follow suit.

The latest speculation about Sperry is that it will wait until September to unveil its next high-end product line. Some analysts contend the firm will announce a series of systems offering performances ranging from 27 to 90 Mips. It is unclear whether NCR will attempt to counter IBM's 3090. Control Data Corp., in spite of recent financial and directional difficulties, matched IBM's 3090 announcement before the fact. The upper end of CDC's Cyber 180 line offers performance in the same range as the 3090 Model 200 and 400.

Another interesting aspect of the most recent round of mainframe announcements is that they all offer some degree of scientific processing capability and cost several million dollars. It was not too long ago when many DP executives looked upon the multimillion-dollar supercomputers offered by Cray Research, Inc. and CDC as oddities of computing that were used by an eccentric few. Now it seems multimillion-dollar systems are the standard, and scientific processing capabilities are necessary.

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IDEAcomm 5251 is a trademark of IDEAssociates, Inc.

SYSTEMS & PERIPHERALS

Continued from page 86

ers without host software changes.

The unit is said to perform the functions of an IBM 3274-51C cluster controller and to allow Intermec bar code readers and printers (and Ascii components) to emulate IBM's System Network Architecture/Synchronous Data Link Control interactive devices. The devices are said to appear to the IBM mainframe as standard 3270-type terminals.

The 9165 System Control Unit has up to 16 ports that are predefined and electronically set up to handle a selected number of Intermec bar code readers, printers and CRT terminals. Users may change port configurations to tailor the unit to their needs.

Both RS-232C and RS-422 interfaces are available. When RS-422 is used, Intermec readers and printers may be located up to 4,000 ft from the 9165. The unit supports data rates up to 19.2K bit/sec.The single-quantity price is $9,800.

Intermec, P.O. Box 360602, 4405 *Russell Road, Lynnwood, Wash., 98046.*

■ **The Graphics Division of Symbolics, Inc. and Evans & Sutherland, Inc. (E&S) have jointly developed a parallel interface between the Symbolics 3600 family of symbolic processors and the E&S PS 300 line of computer graphics display devices.**

A user can download large vector display lists or transformation matrices from the Symbolics computer and manipulate them using the real-time interactive capabilities in the PS 300. The parallel interface comes in components from both companies. The hardware consists of a bus board that costs $7,900 and a unibus interface card that costs $2,090. Components from E&S are two boards and a cable that cost $11,500.

Symbolics, Graphics Division, 1401 Westwood Blvd., Los Angeles, Calif. 90024.

■ **Dennison Kybe has unwrapped a series of tape cleaner and tester systems for maintaining and evaluating the condition of computer tapes used on 800, 1,600 and 6,250 bit/in. drives.**

The Model 6100 tape cleaner cleans, retenses, removes static charge and rewinds a 2,400-ft reel of tape in less than two minutes. The unit costs $9,995. A cleaner/tester module, Model 6300, evaluates tapes by emulating characteristics of a user's drives. The testing module costs $16,495. The Model 6440 cleaner/tester/communicator, which has RS-232 ports to link to printers or other devices, costs $16,995.

Options include a static eliminator for $250, a strip chart printer for $995 and an erase-after-read option for $275.

Dennison Kybe, 132 Calvary St., Waltham, Mass. 02254.

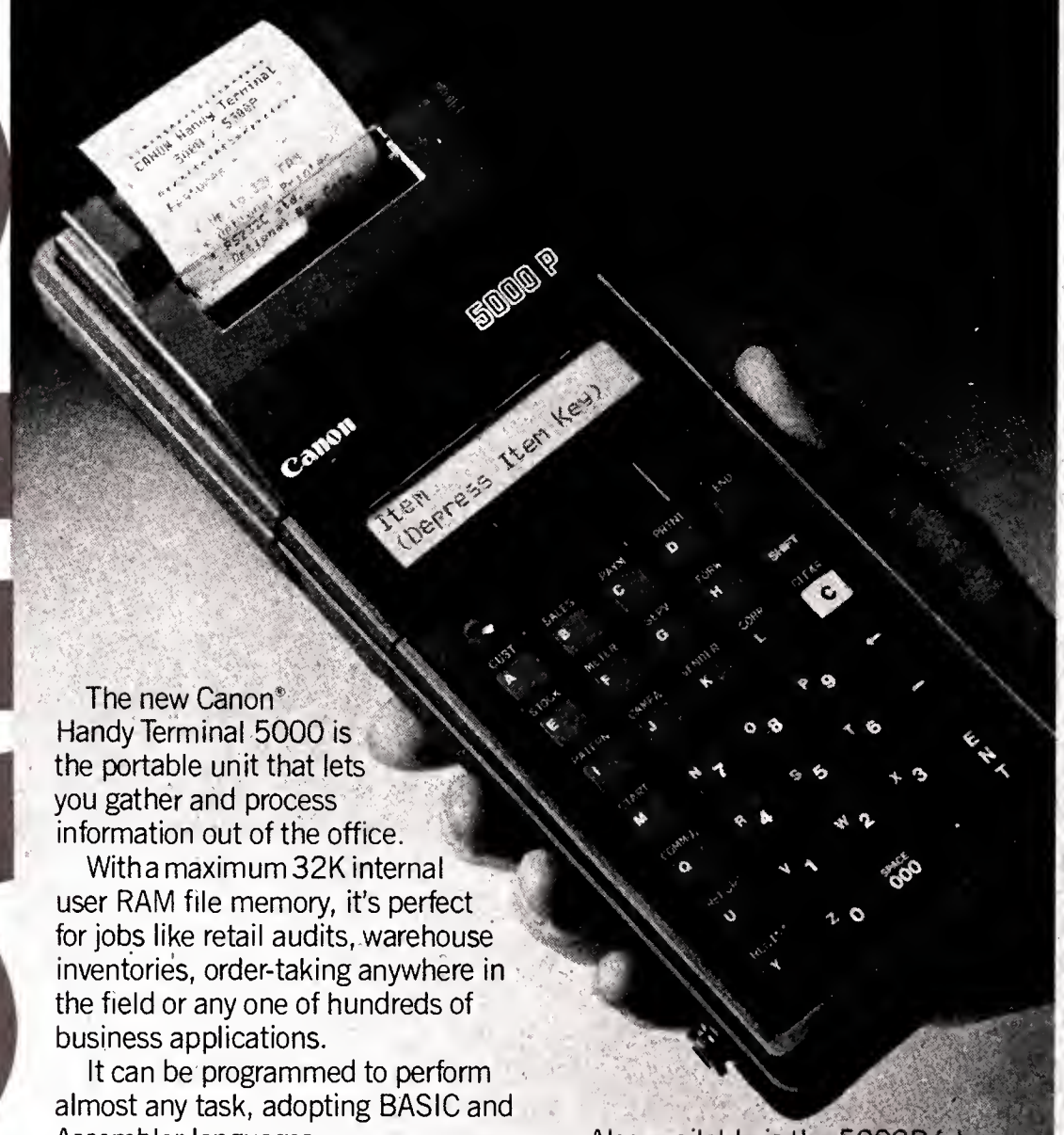
■ **Honeywell, Inc.'s Test Instruments Division has introduced a test management system with the H.TMS 3000 series, an integrated system that allows setup, measurement, analysis, reporting and communication within physical testing environments.**

The H.TMS 3000 test management series consists of three models, the H.TMS 3000/10, 20 and 30, which range from $19,900 to $32,900, depending upon configuration. The units each include internal keyboards, thermal printers, test management software, engineering unit conversion software, math operations software as well as the Regulus operating system by Alcyon, Inc.

Honeywell, Test Instruments Division, P. O. Box 5227, Denver, Colo. 80217.

Canon

The new Canon® Handy Terminal makes any computer system go farther.



The new Canon® Handy Terminal 5000 is the portable unit that lets you gather and process information out of the office.

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It can be programmed to perform almost any task, adopting BASIC and Assembler languages.

And can even relay information to your computer via phone hookup.

Portability is also the key word of the 5000, because Canon's Handy Terminal was especially designed for traveling light.

At a weight of less than 2 lbs., it can operate on a rechargeable battery and can be carried by neck strap or in an attache case. Yet it's highly durable, water resistant and shock resistant. Which means it can take its fair share of hard knocks.

Also available is the 5000P (shown above) which has a built-in thermal dot printer that can print one original and a copy.

And both terminals can incorporate an optional bar code reader.

So why not widen your computer horizons with Canon's new Handy Terminal. It lets you go as far as you like.

For more information:
Call 1-800-323-1717, Ext. 302.
(In Illinois call 1-800-942-8881, Ext. 302.)
Or Write Canon U.S.A., Inc.,
Systems Division/Handy Terminal,
P.O. Box CN 11250, Trenton, N.J. 08650.

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Canon Systems Division

BOARD from page 81

bytes of random-access memory and a local memory section consisting of four 28-pin sites for byte-wide components. The Soemi board communicates with the 4361 through either the IBM 3270 Display Printer Adapter or Work Station Adapter. The physical link is a serial coaxial line with a maximum length of 1.5 km and a maximum transfer rate of 2.35M bit/sec.

The single-quantity price is $2,500. Shipments are scheduled to begin in May.

More information is available from Intel's Literature Department, W-214, 3065 Bowers Ave., Santa Clara, Calif. 95051.

VIDEOTEX from page 81

tial license fee of $2,500. A synchronous communications adapter, priced at $1,500, and protocol software, priced at $440 for Honeywell and $220 for IBM, enable the Infonow central system to transmit captured orders to Honeywell or IBM host order processing systems.

Honeywell is offering this system built around three expandable DPS 6 central systems. The computers range from two 16-bit minis to a 32-bit machine. One port is assigned to local and remote Information Provider workstations and the rest to dial-in lines for user terminals.

Each communications port reportedly can support a total terminal population of 10 users. The basic system includes 11 ports for up to 100 user terminals and can be expanded to 27 end-user ports. The largest central system, with 99 user lines, can support connections for up to 1,000 user terminals.

Honeywell has set up a videotex demonstration and support center in Schiller Park, Ill. where it supports information bases for clients engaged in 60-day business videotex trials. Information on the system and the center is available from Honeywell at 200 Smith St., Waltham, Mass. 02154.

COMPUTER INDUSTRY

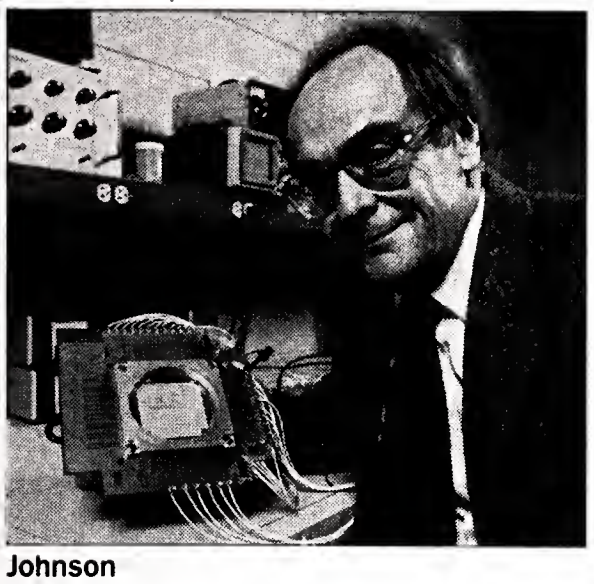
Mosaic reports hybrid wafer test successful

TROY, Mich. — Mosaic Systems, Inc. said last week it had successfully produced and demonstrated a 22-chip version of its hybrid wafer-scale semiconductor technology.

Mosaic's technology directly bonds commercially available logic and memory semiconductor chips to a 4-in. silicon wafer, essentially replacing conventional circuit boards and wiring with the wafer.

In contrast, the unsuccessful attempt by Trilogy Ltd. to develop wafer-scale integration focused on incorporating a massive number of circuits directly in the wafer.

Mosaic said it spent three years developing and proving its proprietary Wafer Hybrid Interconnection Packaging (Whip) technique. Mosaic applies two layers of perpendicular metallized lines upon its wafer, creating a grid or network on the wafer that provides more than 1.5 million



Johnson

interconnections. The two layers are separated by a thin insulating layer of amorphous silicon that becomes conductive at the crossover points when an electrical pulse is applied.

The I/O points of unpackaged logic and memory chips are ultrasonically wire bonded to the metallized grid, according to Mosaic.

Robert R. Johnson, president of Mosaic, said the 22-chip wafer demonstrated here "opens the way for computer manufacturers to start planning for this new wafer-

See **MOSAIC** page 98

Slump pushes Columbia Data off stock listing

By Clinton Wilder
CW Staff

COLUMBIA, Md. — Plagued by sluggish sales, Columbia Data Products, Inc. was recently removed from a stock listing system because of the low value of its shareholders' equity.

One of the many vendors of IBM Personal Computer-compatible microcomputers, Columbia said it will report 1984 losses substantially higher than the $28.7 million posted for the first nine months. The company was taken off the National Association of Securities Dealers' Automated Quotation (Nasdaq) system after dropping below Nasdaq's minimum requirement of $375,000 in equity.

The firm also announced that its founder and chairman, William Diaz, has resigned from the company.

The spate of bad news came after a rocky 1984 for Columbia, which went public and was listed on the Nasdaq system in January 1984. After earning $3.7 million on $56.3 million in revenue in 1983, Columbia was forced in 1984 to lay off 20% of its work force and to report a $1 million loss because of uncollectible accounts. Shareholders filed a federal class action suit against the firm in December.

A company spokesman said Columbia's fiscal report for the year ending Dec. 31, 1984 would be delayed until at least May 31 because of "a reduction in personnel available to assist in the audit" and the introduction of additional accounting procedures.

Columbia currently has an estimated $38 million in outstanding debts consisting of $16 million to trade creditors and $22 million in bank debts. The company is attempting to convert outstanding debt into equity by negotiating with its creditors and hopes to regain its Nasdaq status.

Nasdaq officially stopped listing Columbia stock under the symbol CDPI on April 1. Nasd spokesman George Sierant said the company must petition the exchange sys-

See **SLUMP** page 97

■ A Massachusetts firm recently announced two agreements to provide Ada software technology to Japan's Nippon Telegraph and Telephone/**94**

■ Microcomputer pioneer Vector Graphic scrapped one plan to turn over control of the company in exchange for debt guarantees and instead announced a plan to merge with and turn over control to a manufacturer of AT&T Unix-based systems/**96**

■ Ashton-Tate reported 1984 revenue more than doubled from the previous year, but Micropro International said its revenue in the second quarter was just more than half of revenue for the year-earlier period/**98**

Lotus to absorb Software Arts

Deal includes acquisition of packages, exec moves

CAMBRIDGE, Mass. — Lotus Development Corp. announced last week it had reached an agreement to acquire the assets of Software Arts, Inc., including the Visicalc software package. Additionally, the coauthors of Visicalc agreed to join Lotus.

Lotus said that Chairman Daniel S. Bricklin and President Robert Frankston of Software Arts, headquartered in Wellesley, Mass., had signed letters of intent to join Lotus and turn over the assets of Software Arts to Lotus. In addition to Visicalc, Software Arts developed and markets the TK!Solver and Spotlight packages.

Visicalc was originally marketed by Visicorp, but following a year-long legal battle with Software Arts, Visicorp agreed to pay Software Arts $500,000 in contested royalty payments and relinquish all trademark and marketing rights to the Visicalc name and product [CW, Sept. 24].

With approximately 750,000 packages sold, the Visicalc spreadsheet program is widely credited with spurring the popularity of microcomputer usage. Lotus Chairman Mitchell D. Kapor said, "Today, the fathers of the micro software industry join the leading company in the industry."

Frankson termed the agreement "a perfect marriage." Lotus will provide "significant new support for [Software Arts] products," he said.

Lotus said Spotlight and TK!Solver will

See **ASSETS** page 97

Equity plans can boomerang when execs dump stocks

INDUSTRY INSIGHT
Peter Bartolik
CW Senior Editor

When business is good, equity compensation is a powerful personnel retention tool. When business slumps, the practice of rewarding executives with stock ownership tends to boomerang.

Stock bonuses and stock option plans enable key management personnel to obtain equity holdings in their companies at no cost or at undervalued prices that guarantee a paper profit. It is a relatively inexpensive tool, particularly for younger companies, used to entice valued employees to build a career with the company, rather than job-hop to ever higher salaries.

But, as the recent experiences of three Massachusetts-based companies showed, the accumulation of stock by executives creates a massive public relations problem when a company suffers a setback.

Wang Laboratories, Inc., Digital Equipment Corp. and Data General Corp. have all acknowledged below-target profits for the quarter just ended and their stock prices have slumped. Another Massachussetts firm, Apollo Computer, Inc., has not projected any profit slump but has experienced a decline in the price of its stock.

Hundreds of thousands of shares sold

During the past few months, 56 executives and directors at those four companies reportedly sold hundreds of thousands of shares in their companies.

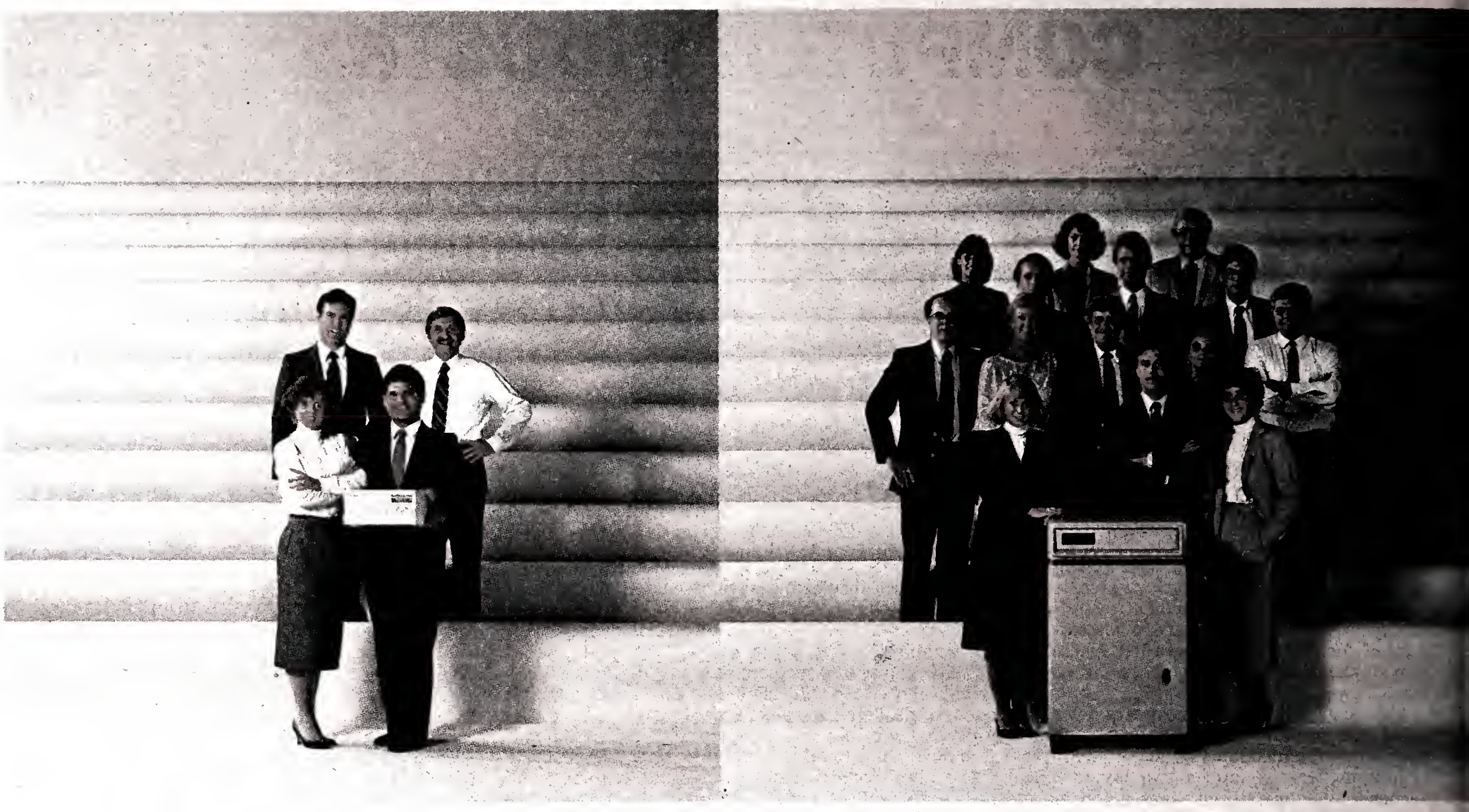
This is not a unique situation; in fact, it happens very often. Executives at public companies can sell stock they own in those companies only at specified times of the year. Probably for tax purposes, the insider trading of stock tends to be heaviest toward the end of the year. It makes sense for somebody holding a large portion of his paper wealth in one company to diversify those holdings into a realistic, planned portfolio.

This goes on all the time, in good times and in bad. But when times are bad — or even just not so good — the practice becomes all the more noticeable and such trading becomes heavier.

Executives are prohibited from trading based on inside knowledge of the fortunes of their companies. But, to be realistic, executives don't have to have advance knowledge of the next financial report to realize that things are getting less rosy. Chief executive officers, chief financial officers and top sales executives are paid to know the week or even the day that sales stop meeting projections.

So a certain amount of insider knowledge goes with the job. The public relations problem is that human nature being what it is, personal financial considerations tend to outweigh company loyalty. The person hasn't been born yet who can

See **STOCK** page 98

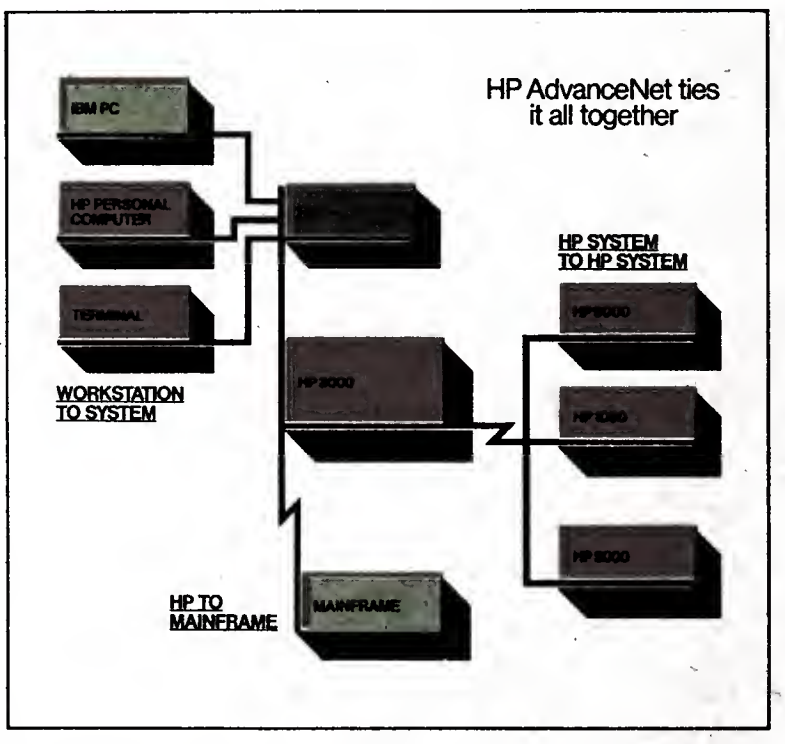


The HP 3000 compu

However much you change, you're going to need both office automation *and* distributed data processing. Fortunately, one company gives you both in a single system.

Hewlett-Packard's HP 3000 is a fully compatible family of computers, ranging from a new system that handles as few as two users to a distributed mainframe that connects up to 400. You can run the same software right up the line.

And our systems can change and grow as you do. When you're ready for upgrades and additions, you simply plug your existing programs into the new systems. No recompiling. No time and money wasted on conversion.



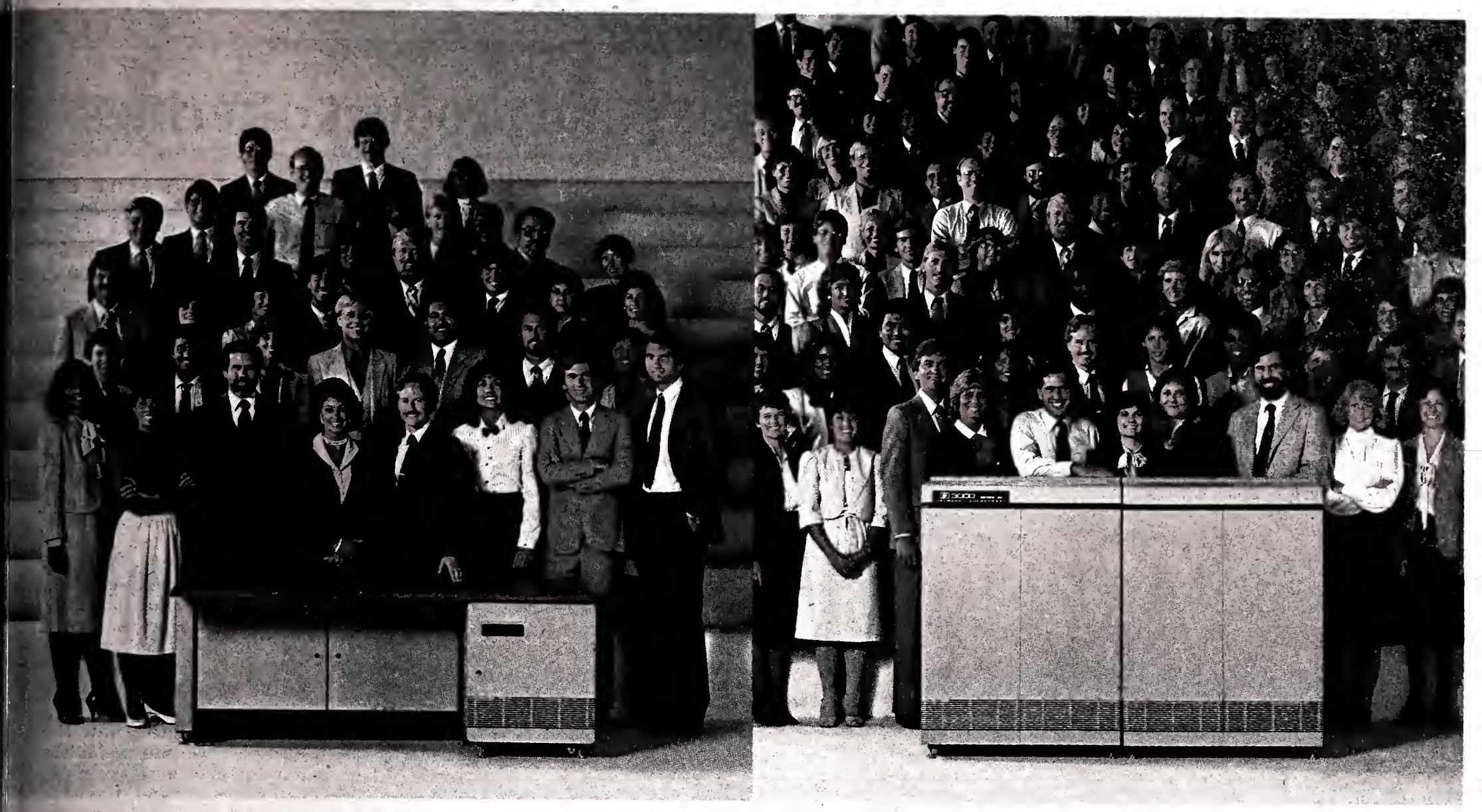
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M&D acquires RSSP, aims to expand product offerings

By Donna Raimondi
CW Staff

NATICK, Mass. — McCormack & Dodge Corp., a division of the Dun & Bradstreet Corp., has acquired Rath and Strong Systems Products, Inc. (RSSP) of Dallas, a manufacturing software business, in an effort to widen the M&D product line.

Complete terms of the agreement were not disclosed, but published estimates indicating that the deal involved between $3 million and $4 million were low, according to Woodrow Chamberlain, former president of RSSP and now vice-president of manufacturing sales for M&D. Frank Dodge, M&D's president, agreed that the reported figures were low and added that the deal was a cash transaction.

The Dallas company brings its Production and Inventory Optimization System (Pios) manufacturing information systems software to M&D, a business applications software house, according to Dodge.

M&D has missed sales opportunities because it did not have a manufacturing system, a spokeswoman for M&D said. "One trend we noticed is that companies are looking to go to one software company for all their systems," she said.

RSSP broke even in 1984 after a very tough year in 1983, Chamberlain said. The marketplace has attracted big players, he noted, citing Cullinet Software, Inc. and Management Science America, Inc. as examples of the competition. "The best strategy for our people and product to prosper was to find a partner," he said.

Current users of the eight-module Pios manufacturing package — which runs on IBM and Digital Equipment Corp. equipment — will be supported as they always have been by RSSP, which will drop its name to become integrated with M&D, Chamberlain said. RSSP will maintain its Dallas location and its employees, he said.

Sales and marketing functions of the two companies will be integrated, Dodge said. He plans to add support and development personnel to the Dallas operations, he added.

M&D will incorporate the Pios package into its Millenium series of business applications software products and will market the system worldwide, spokesman explained.

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The BTI 8000 system is a modular supermini multiprocessor system that can be sized to fit your needs. The system can use up to eight 32-bit CPUs and 24 megabytes of main memory, but you can start with a single CPU system and build up to larger configurations when your needs grow.



As for reliability and service, they're an established BTI tradition. Over 3,000 BTI systems are currently supported by BTI in the U.S., Canada, and Europe.

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BTI Computer Systems, 870 West Maude Ave., Sunnyvale, California 94086 (408) 733-1122
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Net deal arranged

MOUNTAIN VIEW, Calif. — 3Com Corp. and Microsoft Corp. recently announced an agreement to provide IBM PC Network compatibility to 3Com's Etherseries local-area network products.

The two companies also agreed to cooperate on customer contacts and sales.

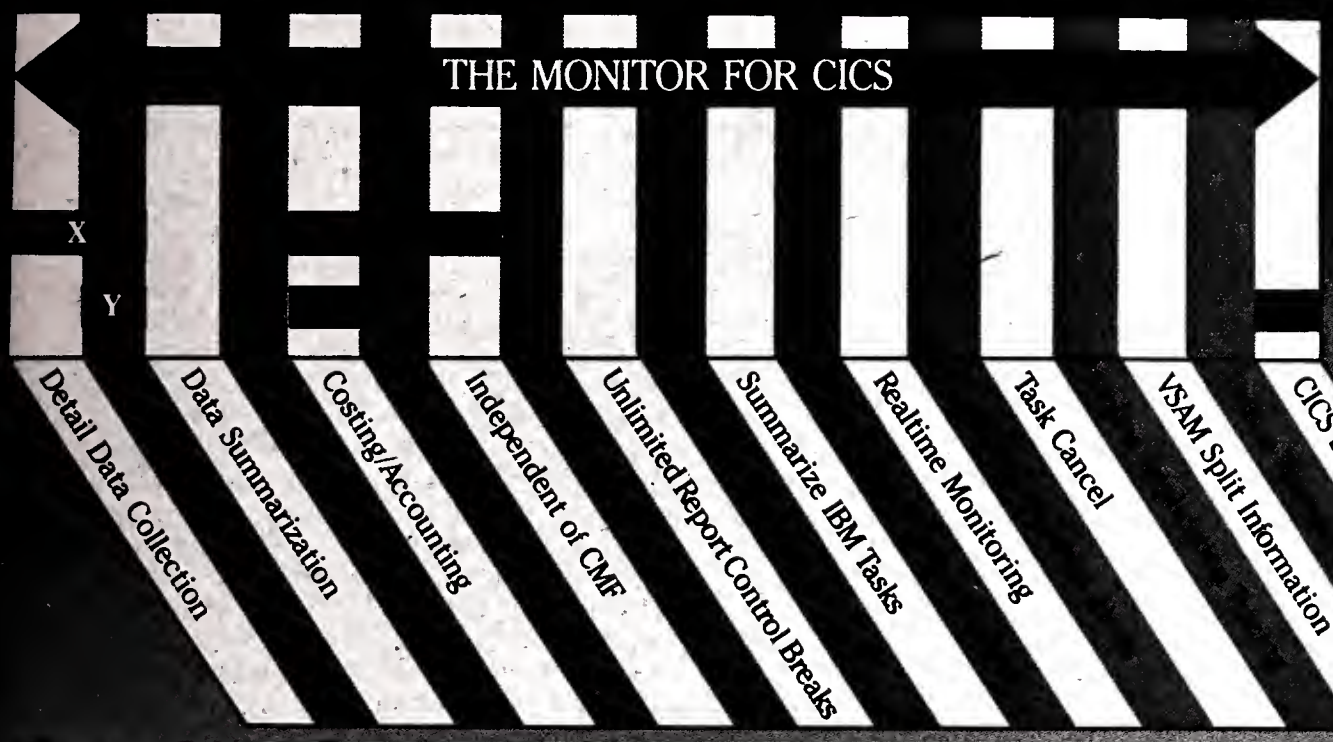
Under the terms of the agreement, future Etherseries network software products will incorporate a portion of Microsoft's Networks software called the Redirector. That module, used with Microsoft's MS-DOS 3.1 operating system, provides IBM PC Network-compatible file and resource sharing across a local-area network, according to spokesmen for the two companies.

The spokesmen said that both the IBM PC Network and Etherseries use software developed by Microsoft and possess a level of applications and network compatibility.

Steve Balmer, vice-president of operating systems software at Microsoft, said the incorporation of the Microsoft module into Etherseries "will allow network applications developed for the IBM PC Network to run without modification on future Etherseries networks. In addition, PC Network-compatible products can be designed in such a way as to take full advantage of Etherseries' advanced networking features."

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COMPUTER INDUSTRY

NTT consents to license Softech's Ada Language System

WALTHAM, Mass. — Softech, Inc. announced recently a license agreement for Nippon Telegraph and Telephone Corp. (NTT) to use Softech's Ada Language System.

Softech also signed a separate agreement to provide NTT with functional design specifications on rehosting and retargeting the Ada Language System at the NTT Dendenkosha Information Processing System (Dips) computers.

Softech's Ada Language System is an Ada programming support environment including software tools such as an Ada compiler, linker debugger, performance analyzers, configuration management and data base maintenance. It was originally developed by Softech for the U.S. Army and is hosted on and targeted at Digital Equipment Corp.'s VAX processors.

Softech said the license agreement was effective immediately and provides NTT with use of Ada Language System as well as maintenance services.

NTT, according to Softech, will use the Ada Language System internally to develop software and services for its customers and may sublicense the Ada Language System in Japan to people involved in contractual agreements with NTT for the purpose of developing hardware and software for NTT's use or for the customer's internal use.

NTT is the developer and operator of most of the telecommunications systems in Japan and is considered one of the largest telecommunications companies in the world. NTT was officially deregulated by the Japanese government early this month and is at the center of a U.S.-Japan trade dispute concerning the ability of U.S. electronics companies to compete in the potentially lucrative Japan telecommunications market that is expected to develop as a result of deregulation.

Justus F. Lowe, president and chief executive officer of Softech, said his company's agreements with NTT represent a milestone both for the company and for the future of the Ada language.

Softech said the Ada Language System was designed to enable simplified rehosting and retargeting at a multitude of computers. Under the terms of the design specifications agreement, Softech said, NTT is preparing to host the Ada Language System on Dips computers operating under AT&T's Unix and NTT's original operating system, Beams.

Burroughs buffs corporate identity to celebrate firm's centennial

DETROIT — Burroughs Corp. recently unveiled a corporate "image" to mark the company's centennial.

Unveiling a new logo and corporate colors to shareholders at the annual meeting, Burroughs Chairman W. Michael Blumenthal declared, "It is a statement of our strong position in the industry. Overall, this new corporate identity will bring a coherence and discipline to our image and our communications and will reinforce the world's understanding of Burroughs as a strong and growing force."

In contrast to the wide array of companies projecting reduced earnings for the quarter just ended, Burroughs' shareholders were told to expect some improvement over the year-earlier quarter, when the company reported profits of $43 million, or 95 cents per share.

Blumenthal said the new logo and colors of crimson and gray were needed because of "evidence that Burroughs is fast becoming a new and more formidable factor in the information processing industry."

But, he added, "Our goals will remain the same — to achieve total customer satisfaction, to deliver error-free competitive products on time and to provide service second to none."

In recent years, Blumenthal said, "We have quite literally built a new company. . . . We have made substantial progress in our financial health, in strengthening and redirecting our management team, in research and development, in quality and service and, of course, in our product line."

In 1984, Burroughs posted a 24% increase in profits to $244.9 million on only a 6% revenue increase, compared with 1983. However, Blumenthal asserted, "Our results worldwide were negatively impacted by the continued strength of the U.S. dollar, despite the growth in operating results by our non-U.S. operations." Entering its second century, Burroughs "will continue to be innovative and imaginative," Blumenthal declared. He added, "We will continue our strategic commitment to targeted lines of business and to maintain our leadership in our own areas of excellence."

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COMPUTER INDUSTRY

Vector Graphic drops deal, merges with Dual Systems

THOUSAND OAKS, Calif. — Microcomputer manufacturer Vector Graphic, Inc. announced recently it has abandoned a plan to offer majority control to a group that would guarantee repayment of the company's debts. Instead, Vector Graphic has agreed to merge with a privately held manufacturer of AT&T Unix-based products.

Earlier this year Vector Graphic had announced a plan to turn over a majority voting position to Eric Tang, representing a group of Hong Kong- and U.S.-based companies, in exchange for guaranteed repayment of $1.7 million of Vector Graphic's total $2.09 million debt [CW, Feb. 18]. The company has been in default on the debt.

Under the agreement in principle announced recently, Vector Graphic will merge with Dual Systems Control Corp. in an exchange of stock that will provide Dual Systems shareholders with 77% of the new company's stock. The new company will retain the Vector Graphic name.

Pending final approval of the merger, day-to-day operations of Vector will be managed by Dual Systems under the supervision of the Vector board of directors pursuant to terms of a management contract and a joint operating plan.

That management contract stipulates the resignation of Bernard Horn, chief executive officer and president of Vector, and Richard A. Hahn, senior vice-president of marketing and sales. Horn will retain his position as a member of the board of directors, but Hahn resigned his seat.

Dual Systems manufactures and markets a 16/32-bit Unix-based multiuser computer system and board-level products. According to spokesmen for the companies, Dual Systems earned profits of $1 million in 1984 on revenue of $10 million.

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Olivetti offers to buy equity of ailing firm

DALLAS — Italian computer manufacturer Ing. C. Olivetti & Co., a 46% shareholder of slumping Docutel/Olivetti Corp., recently offered to acquire Docutel/Olivetti's remaining equity at $5.50 per share in a cash merger transaction.

The deal is subject to approval by Docutel/Olivetti's board of directors and shareholders.

The Dallas-based manufacturer of automated teller machines reported a loss of $41.9 million, or $6.16 per share, for the fiscal year ending Dec. 31. Revenue dropped from $221.8 million to $164 million during the year. The firm had lost $18.3 million in 1983.

Fourth-quarter loss

Docutel/Olivetti's fourth-quarter loss was $12.4 million, or $1.81 per share, compared with a loss of $17.5 million, or $2.57 per share, in the fourth quarter of 1983.

A spokesman blamed the fiscal 1984 results on decreased sales, losses related to start-up and operating costs of off-premises ATM networks and the loss of tax benefits that earned $8.1 million in 1983. Revenue for 1983 also included $5.4 million earned from the sale of the company's maintenance operations.

In addition to its ATM manufacturing, Docutel/Olivetti markets Ing. C. Olivetti microcomputers, electronic typewriters, financial work stations, word processors and office equipment in the U.S.

SLUMP from page 89.

tem for reinstatement after it meets the equity requirement. Columbia's stock will continue to be traded over the counter without the Nasdaq listing, he said.

Aaron Goldberg, an analyst with International Data Corp. in Santa Clara, Calif., said Columbia went public at a time of slow microcomputer market growth, IBM Personal Computer price cuts and increased competition in the IBM-compatible market.

"Columbia got caught in a triple whammy," Goldberg said. "In late 1983 and early 1984, dealers were discounting their IBM products and demanding that the compatible makers discount, too. For a company accustomed to higher pricing in an expanding market, it's hard to change expectations that quickly. Columbia had an overgrown asset base to support its level of business."

Goldberg said a lack of company name recognition also dampened Columbia's sales of its IBM-compatible portable, desktop and hard-disk micros. "Brand names became important, and Columbia suffered," he said. "When they reported quarterly losses later in the year, they were under a microscope, and when that happens, the customer base gets a little leery of buying the product. Bad news propagates itself, and it's hard to turn around."

Goldberg said he believes Columbia's prospects for a 1985 recovery, however, are not impossible. "As in the case of Osborne Computer Corp., anyone with good astute management can recover," he said. "It depends on how well they can reshape the company to work at a different revenue level, with a different corporate philosophy."

ASSETS from page 89.

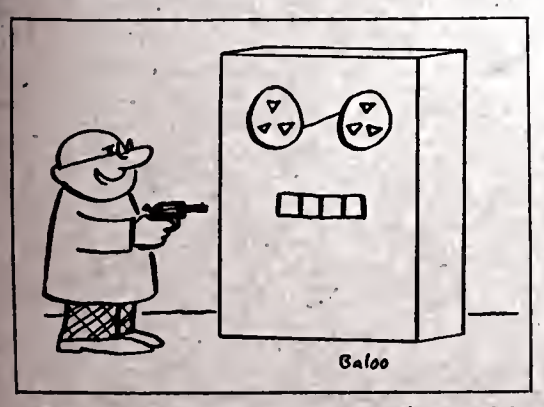
be distributed through its regular authorized dealer channels.

Final terms of the agreement are being negotiated, and Software Arts will continue to market and support its products pending a final agreement, Lotus said.

Marketing responsibility for TK!Solver will be assigned to a division created recently at Lotus, the Engineering and Scientific Products Division.

Under the direction of Lotus Vice-President Sandra Gunn, the division will develop microcomputer software products focusing on the analytical and task-oriented computing needs of engineers and scientists, the company said.

Appointed director of product planning and development for the new division was Glenn Patch, formerly director of new technology and product development at Interactive Data Corp.



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MCI, U.S. West agree on access terms

WASHINGTON, D.C. — MCI Communications Corp. and U.S. West recently announced an agreement between MCI and the three U.S. West regional telephone companies that were named in MCI's 1979 antitrust suit against AT&T, the Bell system and various independent telephone companies.

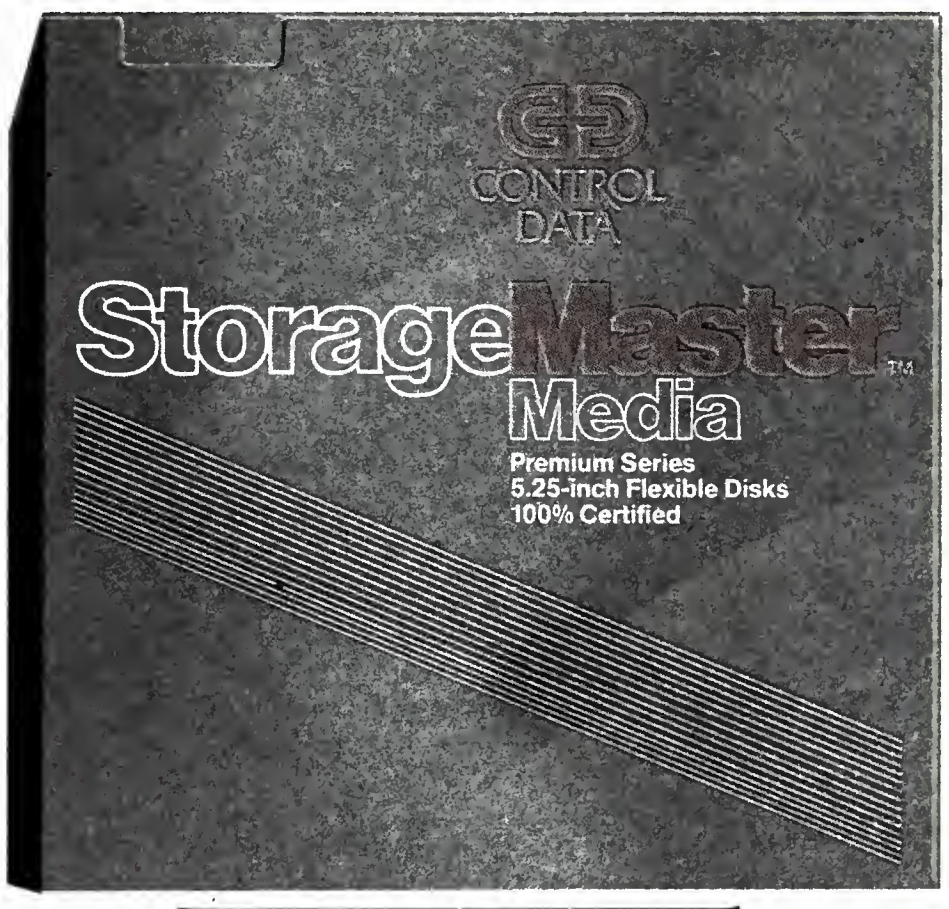
Under terms of the settlement, the defendants — The Mountain States Telephone and Telegraph Co., Northwestern Bell Telephone Co. and Pacific Northwest Bell Telephone Co. — agreed to perform long-distance billing services for MCI and to purchase MCI's long-distance and other telecommunications services for their official use. The agreement also included cash payments of an undisclosed amount.

Further terms specified that Mountain Bell and Pacific Northwest Bell will adopt a customer equal-access conversion plan already used by Northwestern Bell. The plan gives customers two chances to select a long-distance telephone company from among those offering long-distance services in their area, including MCI. Customers who do not respond are assigned randomly among the alternative companies in the same percentages as those who did make a selection.

MCI and U.S. West said the agreement should increase customer understanding of the conversion process and promote long-distance competition. "We have healed old wounds, and the principal beneficiaries will be the millions of telephone customers in the 14-state area served by U.S. West," said MCI President and Chief Executive Officer V. Orville Wright.

The settlement does not affect the other parties named by MCI in the 1979 suit, which has not been concluded. MCI reached agreement in January 1985 with another defendant named in the suit, Continental Telecom, Inc.

A retrial is pending on MCI's initial 1974 civil antitrust suit against AT&T, the Bell system and independent telephone firms.



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CONTROL DATA

STOCK from page 89

resist the temptation to cut losses.

So when the executives sell off a portion of their holdings during bad times, other stockholders and the public in general can hardly be blamed for reconsidering their view of the affected company.

Some people believe that when insiders turn bearish, it can only mean the situation is going to get worse. That in turn leads to lowered expectations for the companies and to reconsideration by potential customers. And when customers hesitate, sales slump even further, leading to more insider trading and so on. Considering the amount of money spent on advertising and public relations, perhaps companies should devote some attention to restricting further the ability of executives to sell.

MOSAIC from page 89

scale interconnection technology in their commercial products."

Attending the demonstration were representatives of Floating Point Systems, Inc., the Beaverton, Ore.-based vendor of array processors and scientific computers. Lloyd D. Turner, president of Floating Point, said his company "will begin immediately to work with Mosaic to identify possible ways of incorporating Whip technology into future Floating Point products."

According to Johnson, Mosaic plans to deliver a 50-chip wafer this spring to Evans & Sutherland Computer Corp. located in Salt Lake City; reportedly, the chip will be a wafer-scale equivalent of the visual display driver used in Evans & Sutherland's advanced flight simulator supercomputer. Mosaic also plans to ship wafers to Siemens AG of West Germany and other firms for evaluation.

Mosaic said the technique will enable computer designers to specify a combination of chips for a wafer, including Cmos, bipolar, gallium arsenide and analog chips.

According to Floating Point Systems's Turner, the Mosaic development of 50-chip wafers "promises to give the computer industry very important new options for designing high-performance computers and producing them at competitive costs."

Mosaic is a privately held company financed by a syndicate of venture capital firms, including Evans & Sutherland, Advanced Technology Ventures of Boston and Venrock Associates of New York and other investors.

Ashton-Tate earnings rise

CULVER CITY, Calif. — Ashton-Tate recently announced fiscal 1985 revenue of $82.3 million, more than double its $39.8 million sales for the previous year.

Ashton-Tate reported earnings of $7.5 million for the fiscal year ended Jan. 31, a 20% increase from $6.2 million the previous year. Earnings per share were 80 cents, up from 73 cents per share in fiscal 1984.

The earnings reported by the company included a nonrecurring, extraordinary income item of $1 million, reported in the third quarter, from life insurance proceeds after the Aug. 10 death of company cofounder George Tate.

Ashton-Tate's fourth-quarter revenue in fiscal 1985 was $27.2 million, a 102% increase from $13.5 million in the same quarter of 1984. The company earned $3.1 million, or 34 cents per share, in the fourth quarter, surpassing by 72% its fourth-quarter 1984 earnings of $1.8 million, or 20 cents per share.

Micropro posts second-quarter loss of $669,000

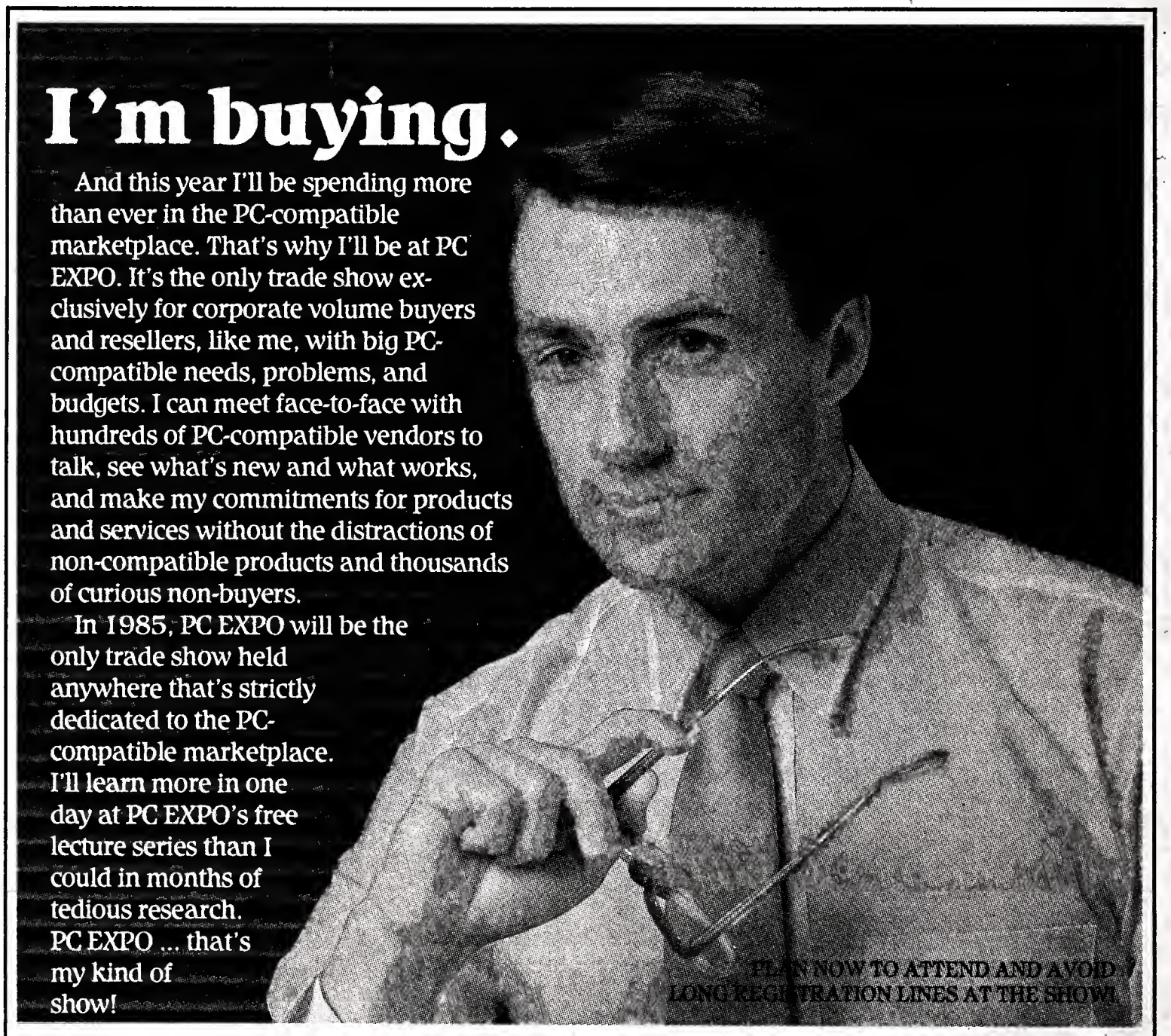
SAN RAFAEL, Calif. — Citing a continued slowdown in microcomputer hardware sales and increased competition in word processing software, Micropro International Corp. reported a loss of $669,000, or 5 cents per share, for its second quarter ended Feb. 28.

Micropro reported revenue for the quarter was $9.9 million, down from $18.5 million a year ago. The company earned $3 million, or 26 cents per share, in the second quarter of 1984.

The maker of Wordstar said its sales to OEMs have declined because of domination of the micro market by the IBM Personal Computer, Personal Computer XT and AT.

Micropro said domestic sales of Wordstar 2000 and Wordstar 2000+, its latest products, accounted for 50% of its sales in the quarter. The company plans to market these products more extensively to OEMs and in foreign language versions in the future, according to a spokesman.

The company reported its working capital position increased to $23.1 million during the quarter, the fourth such quarterly increase since its stock went public in March 1984. The figure included cash and cash equivalents of $14.6 million, according to the company.



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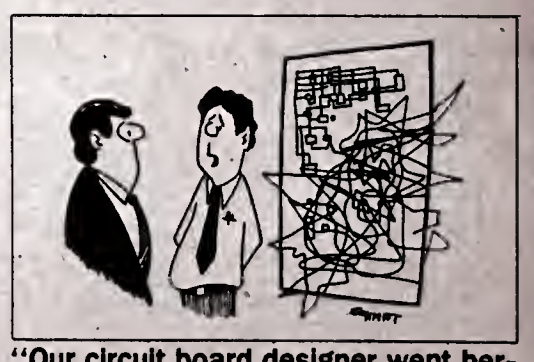
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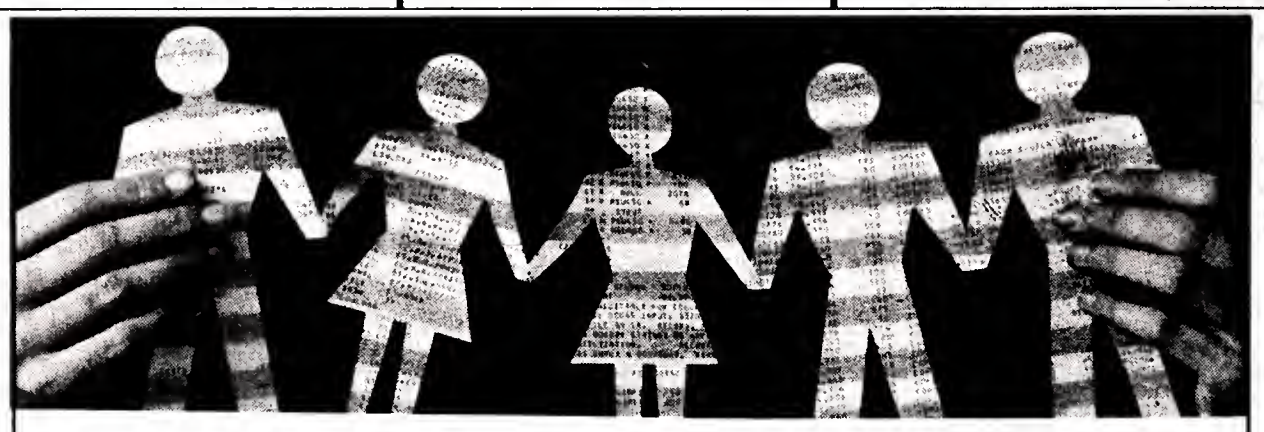
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Applications for these posts, together with full detailed and updated resumes (including three references and contact address) and photocopies of the candidate's diplomas and experience credentials should be mailed to:

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Department of Studies and Organization
King Saud University
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Riyadh 11451, Saudi Arabia

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Structured Design of Online Real-Time Information Systems
Information Systems Implementation in high level languages such as COBOL, PL/1, etc.
Development of test cases and testing procedures to test system's modules and their interfaces
Development of systems, operation, and user documentation
Database model and logical design to support systems' data structures requirements
Design of Applications - Hospital, Finance, Students Admission and Registration, Budget and Planning, Human Resources, Inventory Control, etc.
Design of applications performance and efficiency benchmarks
Software packages study and evaluation
Data definition for hardware and system software requirements

SYSTEMS ANALYSTS
Detail Planning of the Development of Online Information Systems and Databases Support
Online Real-Time Information Systems Requirements Definition, analysis, design and implementation
Distributed and Centralized Databases requirements definition
Structured Databases and Systems Design
Systems integration requirements definition and design
Hardware and systems software detail requirements definition
Information systems requirements support, user interface, performance, and benchmarking study and evaluation
Hardware cost/performance analysis and evaluation
Systems development and continuous development personnel resources definition, planning, and analysis
User communication, interaction, and feedback
Applications functional requirements - Hospital, Students Information, Financial, Budget and Planning, Human Resources, Purchasing, Inventory Control, Library, Maintenance, etc.

DATA BASE ADMINISTRATORS
Development of standards for databases design, implementation, testing, and operation
Institutionwide database requirements definition and implementation scheduling
Databases development planning and scheduling
Databases security and access control definition
Databases models, logical, and physical design, evaluation, implementation, and testing
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Databases presents and future storage requirements
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Databases documentation standards
Databases guidelines for maintenance, updating, and modification
Guidelines for databases security, privacy, and auditability control
Databases performance study and analysis
Control of usage of DBMS tools and utilities
Development of databases backup, recovery, and restart procedures
Management of DMBSs - ADABASE, IDMS, IMS, or other general purpose data base management systems

SYSTEMS PROGRAMMERS (IBM or VAX)
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Development of backup, recovery, and restart procedures
Installation and testing of System, Utilities, Languages, and DBMS packages
Development of Basic Input Output Systems and drivers to support the installation of I/O devices
Development of macros to support applications development
Develop and implement procedures for performance measurement and evaluation
Disk storage utilization checking
System utilization and projection for performance improvement
Hardware and software requirements to support present and future application development and production
IBM 370 or VAX 11/780 Assembler macro routines coding and JCL support for application development
System programming in IBM or plug compatible hardware or VAX hardware using - MVS, VM in conjunction with TSO, CMS, or CICS, or VAX/VMS

CAD/CAM SYSTEMS PROGRAMMER
Development of graphic routines to support CAD/CAM users
Design and implementation of I/O graphic devices drivers (e.g. Tecktronix and DEC graphic workstations and plotters)
Operation of a VAX based graphic computer system
Operating System, Languages, and Graphic Application packages installation and maintenance on VAX 11/780
Backup, recovery, and start up procedures and implementation
System utilization, performance evaluation, and projection for performance improvement
CAD/CAM users support

Candidates applying for any of the above five positions must have 3 to 5 years work experience in the areas stated in each description and a university education in Computer, Information Management Science, or related areas of study. In addition, all the areas of studies specified above are highly technical, and the candidate must have practical experience in some of the areas listed in each position.

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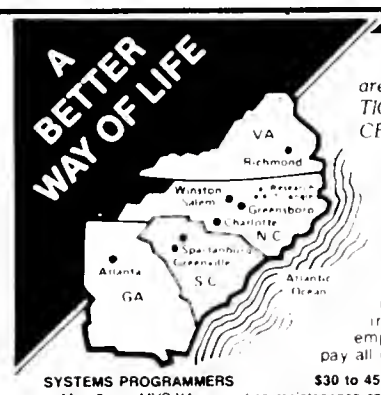
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The **Manager of Technical Services** will be responsible for the detailed planning and delivery of operating system support of VM/CMS and UNIX as well as data communication services. A major responsibility will be the development of staff to support these efforts. There are currently nine persons in this group and several new positions are to be added.

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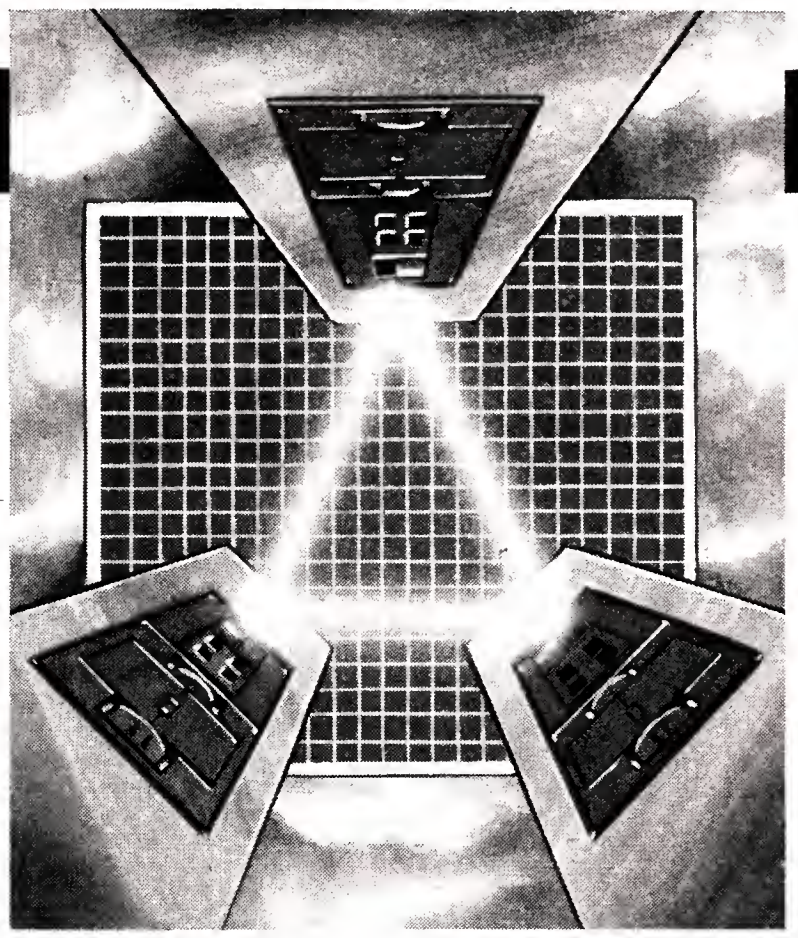
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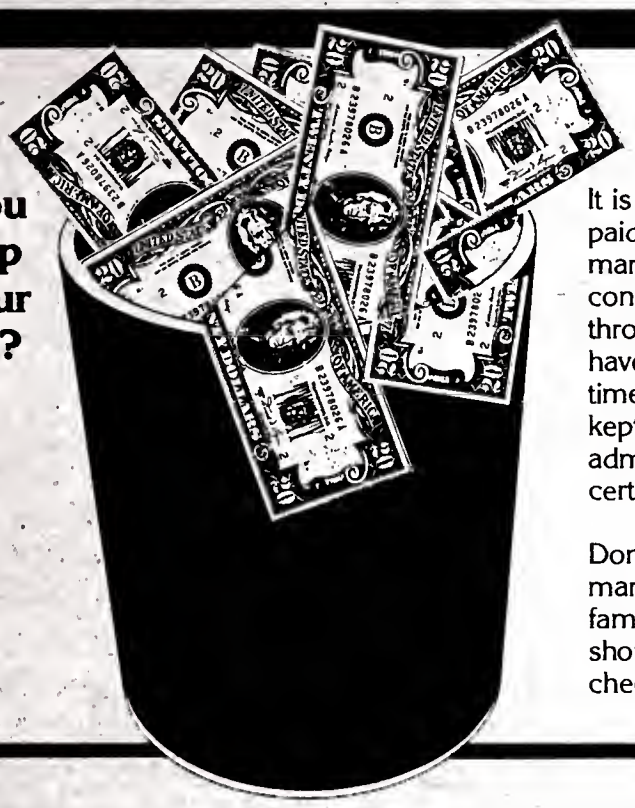
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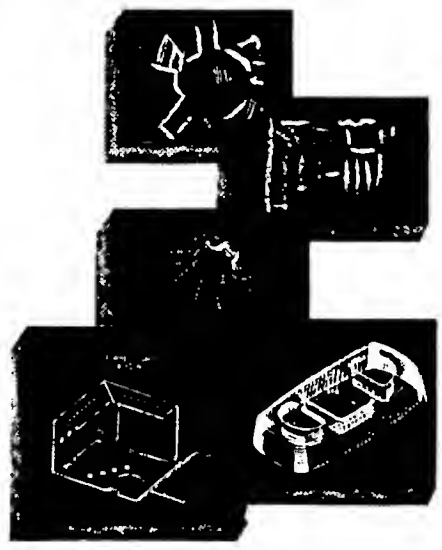
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4361-3	0.70	2 to 4
4341-10	0.75	2 to 4
4341-1	0.88	2 to 4
4341-11	1.1	2 to 8
4361-4	1.15	2 to 12
3031	1.2	2 to 8
4361-5	1.45	2 to 12
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4341-12	1.65	2 to 16
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4381-1	2.1	4 to 16
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3033N	4.3	4 to 16
3083X	4.4	8 to 32
3033UP	5.0	4 to 24
3083B	6.3	8 to 32
3083BX	6.6	8 to 32
3083J	8.4	8 to 32
3033MP	8.5	8 to 32
3033AP	8.5	4 to 24
3083JX	8.8	8 to 32
3081D	10.0	16 to 32
3081G	11.0	16 to 48
3081GX	11.9	16 to 64
3081K	14.0	16 to 48
3081KX	15.5	16 to 64
3084G	26.6	32 to 96
3084QX	28.7	32 to 128
•3090-200	29.4	64 to 192
†3090-400	52.9	128 to 384

• First Installation 1985 †First installation 1987

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470V/7	5.5	8 to 32
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5840	8.4	16 to 64
5850	11.6	16 to 64
5860	14.0	16 to 64
5867	22.0	24 to 64
5868	22.0	32 to 128
5870	26.6	16 to 64
5880	26.6	32 to 128

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AS/9050	9	8 to 48
AS/9060	11.2	16 to 64
AS/9070	16.2	16 to 64
AS/9080	20	16 to 64
†AS/XL-60	28	32 to 256
†AS/XL-80	50	64 to 256

†First installation 1986

The above information is intended as a guideline for computer users on relative computer system instruction cycle times. All data have been derived from published documentation and represent reasonable estimates of average MIPS ratings. However, Randolph is not responsible for the accuracy of the MIPS data. Cycle times will vary based upon hardware/software configurations, and system manufacturers continually modify computer models as design improvements in hardware and software arise.

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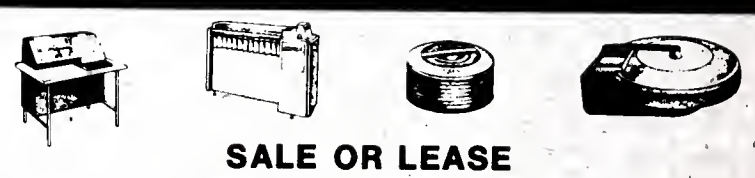
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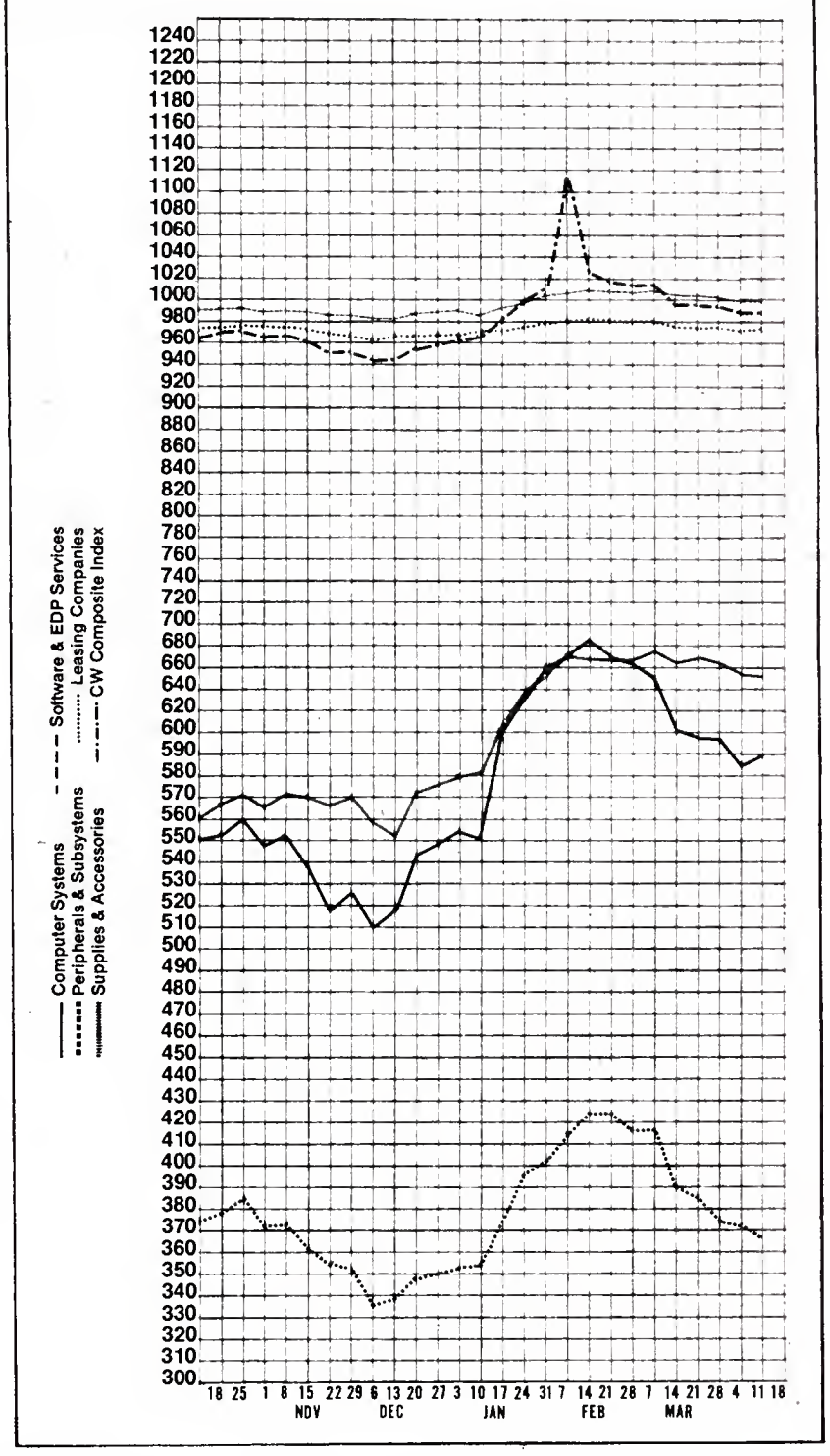
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Computerworld Stock Trading Index



Computerworld Stock Trading Summary

TRADE QUOTES

CLOSING PRICES WEDNESDAY, APRIL 10, 1985

All statistics compiled, computed and formatted by TRADE QUOTES, INC Cambridge, Mass 02139

		1984-85 RANGE (1)	CLOSE APR 10 1985	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
O	ALPHA MICROSYSTEMS	6- 24	7 3/4	+ 3/4	+10.7
O	ALTOS COMPUTER SYST	7- 21	10 3/8	0	0.0
A	AMDAHL CORP	10- 19	15	+ 1/8	+0.8
O	APPLE COMPUTER INC	1R- 63	21	0	0.0
N	AT&T	15- 22	21	+ 1/4	+1.2
N	BURROUGHS CORP	48- 64	58 1/2	- 5/8	-1.0
O	COMPAQ COMPUTER CP	4- 15	8	+ 3/8	+4.9
O	COMPUTER AUTOMATION	3- 17	7 3/8	- 1/2	-6.3
A	COMPUTER CONSOLES	8- 20	7 5/8	- 1/8	-1.6
N	CONTROL DATA CORP	25- 39	31	+ 1/4	+0.8
O	CONVERGENT TECHNOL	5- 41	8 1/4	0	0.0
N	CRAY RESEARCH INC	38- 79	67 1/2	+1 1/2	+2.2
O	DAIRY SYSTEMS CORP	14- 36	29 1/4	+1 3/4	+6.3
N	DATA GENERAL CORP	39- 74	45 5/8	+2 1/4	+5.1
N	DATAPOINT CORP	13- 28	15 1/4	- 3/4	-4.6
N	DIGITAL EQUIPMENT	77-125	104 5/8	+2 5/8	+2.5
A	EECO INC	12- 15	14 3/8	- 1/4	-1.7
N	ELECTRONIC ASSOC.	3- 7	4 7/8	+ 1/2	+11.4
N	FLOATING POINT SYST	13- 31	27	+ 3/8	+1.4
N	FOXBORO	28- 38	28 3/4	+1 3/4	+6.4
O	GENERAL AUTOMATION	5- 18	5 5/8	- 1/4	-4.2
N	GOULD INC	20- 32	23 1/2	+ 3/8	+1.8
N	HARRIS CORP	23- 35	27 1/4	0	0.0
N	HEWLETT-PACKARD CO	31- 44	33 1/4	- 1/4	-0.7
N	HONEYWELL INC	48- 69	58 1/4	-2 3/8	-4.0
N	IBM	88-137	125 7/8	- 5/8	-0.4
O	IPL SYSTEMS INC	1- 14	2 1/2	- 1/8	-4.7
N	ITT CORP	21- 42	33 3/8	-1 3/4	-4.9
N	M/A-COM INC	13- 24	18	- 7/8	-4.6
N	MANAGEMENT ASSIST	3- 28	3 1/8	- 1/8	-3.8
N	MATSUSHITA ELEC(ADR)	52- 81	57 1/2	-1 3/4	-2.9
N	MODULAR COMPUTER SYS	8- 10	8 7/8	+ 1/8	+1.8
N	MOHAWK DATA SCI	5- 17	5 1/4	-1 1/8	-17.6
N	MOTOROLA INC	29- 44	32 1/2	- 3/4	-2.2
N	NAT'L SEMICONDUCTOR	11- 17	11 1/4	0	0.0
N	NBI INC	13- 24	14	- 3/8	-2.6
N	NCR	21- 31	27 7/8	+ 5/8	+2.2
N	PERKIN-ELMER	18- 30	24 1/8	- 7/8	-3.5
N	PRIME COMPUTER INC	11- 20	18 3/4	+ 3/4	+4.6
N	SPERRY CORP	35- 54	49 7/8	-1 5/8	-3.1
O	STRATUS COMPUTER INC	8- 17	14 1/8	- 1/8	-0.8
O	TANDEM COMPUTERS INC	15- 40	23 1/4	+3 3/8	+16.9
N	TANDY CORP	24- 37	33 7/8	+ 3/8	+1.1
O	TELEVIDEO SYSTEMS	3- 41	2 3/4	0	0.0
O	TELXON CORP	8- 20	19 1/2	- 1/2	-2.5
N	TEXAS INSTRUMENTS	101-150	112 3/8	+1 5/8	+1.4
A	ULTIMATE CORP	10- 24	11 1/4	+ 1/8	+1.1
O	VECTOR GRAPHIC INC	0- 9	3/4	+ 1/4	+44.4
A	WANG LABS "B"	18- 32	19	+ 5/8	+3.4
A	WANG LABS "C"	18- 32	19 1/4	+ 1/2	+2.6
N	XEROX CORP	35- 46	43 3/4	+ 5/8	+1.4
	LEASING COMPANIES				
O	BOOTHE FINANCIAL CP	10- 22	18 7/8	- 3/8	-1.8
A	CMI CORP	4- 10	8	- 1/8	-1.5
N	COMDISCO INC	8- 17	18	+ 1/2	+3.2
O	CONTINENTAL INFO SYS	5- 16	7 7/8	- 1/2	-5.9
N	DPF INC	10- 17	18	+ 1/8	+0.7
O	FINALCO GROUP INC	4- 12	4	+ 3/8	+10.3
O	PHOENIX AMERICAN INC	3- 17	2 3/4	+ 1/8	+4.7
O	SELECTERM INC	8- 21	9 1/2	+ 1/4	+2.7
N	U.S. LEASING	28- 44	38 1/4	+ 3/8	+0.8
	COMPONENTS				
N	ADVANCED MICRO DEV	25- 41	31 1/8	- 3/4	-2.3
O	ADV'D SEMICONDUCTOR	14- 38	13 1/2	- 3/4	-5.2
N	ANALOG DEVICES INC	20- 32	25 5/8	0	0.0
O	ANALOGIC CORP	10- 31	12 1/2	0	0.0
N	APPLIED MAGNETICS CP	8- 21	12 5/8	+ 1/4	+2.0
O	HADCO CORP	5- 12	4 1/2	- 1/4	-5.2
O	MICRO MASK INC	8- 18	8 1/8	- 1/4	-2.9
N	TERADYNE	22- 35	22 1/4	- 3/8	-1.6

EXCH: N=NEW YORK; A=AMERICAN; P=PACIFIC; B=BOSTON; L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

		1984-85 RANGE (1)	CLOSE APR 10 1985	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	2- 8	2 1/2	0	0.0
N	ADVANCED SYSTEMS INC	8- 22	10 3/8	-1 1/8	-9.7
O	AGS COMPUTERS INC	10- 32	11 1/2	- 1/2	-4.1
O	AMERICAN SOFTWARE	12- 31	18 1/4	- 3/4	-3.9
N	ANACOMP INC	1- 5	3 1/2	0	0.0
O	ANALYSTS INTL CORP	5- 17	9	+ 7/8	+10.7
N	APPLIED DATA RES	18- 38	29 1/4	- 1/8	-0.4
O	ASHTON TATE	6- 15	9 1/4	+ 1/2	+5.7
O	ASK COMPUTER SYSTEMS	13- 24	15	-1 1/2	-9.0
B	ASTRODYNE COMP INC	1- 7	2 1/8	0	0.0
N	AUTOMATIC DATA PROC	30- 46	43 7/8	- 3/4	-1.6
O	COMPUTER ASSOC INT'L	15- 35	24 1/4	+ 1/2	+2.1
C	COMPUTER HORIZONS	8- 20	8	+ 1/8	+1.5
O	COMPUTER NETWORK	5- 11	7 3/4	0	0.0
N	COMPUTER SCIENCES	11- 17	15 1/4	0	0.0
O	COMPUTER TASK GROUP	12- 21	19 1/2	+ 3/4	+4.0
O	COMPUTER USAGE	1- 18	1 1/4	0	0.0
O	COMPUTONE SYSTEMS	4- 23	8 5/8	+ 1/8	+1.4
O	COMSERV CORP	1- 16	3 1/8	- 1/8	-3.8
O	COMSHARE	6- 14	8 3/8	- 3/8	-4.2
N	CULLINET SOFTWARE	12- 36	27 7/8	+1 5/8	+6.1
O	CYCARE SYSTEMS INC	16- 27	23 3/4	+ 3/4	+3.2
O	HOGAN SYSTEM INC	5- 27	5 3/8	- 1/8	-2.2
N	GENERAL ELECTRIC CO	48- 65	59 1/8	-1 1/4	-2.0
N	GEN. MOTORS C (EDS)	22- 72	61	+ 1/2	+0.8
N	GTE CORP	36- 45	38 3/4	-1	-2.4
N	INFORMATICS GENERAL	14- 24	20 1/4	+2 1/2	+14.0
O	INFORMATION SCIENCE	3- 17	2 3/4	0	0.0
O	INFOTRON SYSTEMS CP	15- 43	20 3/4	-1	-4.5
O	KEANE ASSOCIATES	6- 15	14	0	0.0
A	LOGICON	18- 34	32 7/8	- 7/8	-2.5
O	LOTUS DEVELOPMENT CP	15- 40	27 1/2	+2	+7.8
O	MCI COMMUNICATIONS	6- 28	9 1/4	- 1/2	-5.1
O	MGT SCI AMER INC	9- 33	11 1/2	+ 5/8	+5.7
O	MATHEMATICAL APP GRP	6- 18	5 1/2	0	0.0
O	MICOM SYSTEMS INC	25- 50	24 3/4	-2 3/4	-10.0
O	MICROPRO INT'L CP	2- 10	2 3/4	- 1/8	-4.3
O	NATIONAL DATA CORP	8- 26	10 7/8	+ 1/4	+2.3
O	ON-LINE SOFTWARE INT	4- 29	6 3/4	+ 1/2	+8.0
O	PANSOPHIC SYSTEMS	11- 30	17 1/2	+ 1/2	+2.9
N	PLANNING RESEARCH	10- 15	11 3/8	- 1/8	-1.0
O	POLICY MGMT SYSTS CP	22- 35	27	+ 1/2	+1.8
O	PROGRAMMING & SYS	4- 8	5 3/8	0	0.0
O	REYNOLDS & REYNOLD	28- 53	37	0	0.0
O	SCI CORP	11- 34	19	0	0.0
O	SHARED MEDICAL SYST	23- 43	30 3/4	+1	+3.3
O	SCIENTIFIC COMPUTERS	5- 14	6	- 3/8	-5.8
O	SOFTWARE AG	9- 21	14 1/4	- 1/8	-0.8
N	TRW CORP	10- 14	12 1/8	+ 5/8	+5.4
N	UCCEL	7- 17	13 3/8	+ 1/8	+0.9
	PERIPHERALS & SUBSYSTEMS				
P	AM INTERNATIONAL	2- 7	4	+ 1/8	+3.2
A	ANDERSON JACOBSON	3- 11	5 1/8	- 1/4	-7.4
O	AST RESEARCH INC	7- 20	18 1/8	+1 1/8	+8.8
O	AUTO-TROL TECHNOLOGY	8- 29	8 1/4	- 3/4	-8.3
O	AVANT-GARDE COMPUTNG	11- 29	11 3/4	- 1/4	-2.0
C	BANCTEC INC	5- 22	10 3/4	0	0.0
A	BEEHIVE INT'L	1- 7	1 1/8	0	0.0
N	BOLT,BERANEK & NEW	17- 30	28 7/8	+ 7/8	+3.3
O	CAMBEX CORP	1- 3	1 5/8	0	0.0
A	CENTRONICS DATA COMP	4- 14	4	- 1/2	-11.1
A	CETEC CORP	7- 12	6 5/8	- 1/4	-3.8
A	COGNITRONICS	4- 8	4 3/4	- 1/4	-5.0

		1984-85 RANGE (1)	CLOSE APR 10 1985	WEEK NET CHNGE	WEEK PCT CHNGE
N	COMPUGRAPHIC CORP	26- 37	32	+ 3/8	+1.1
O	COMPUTER TRANSCEIVER	1- 10	1	0	0.0
N	COMPUTERVISION CORP	18- 46	17 3/8	+1	+6.1
N	CONRAC CORP	11- 17	13 1/4	0	0.0
A	DATAPRODUCTS CORP	13- 26	14	+ 1/4	+1.8
A	DATARAM CORP	4- 12	5 3/4	+ 1/8	+2.2
O	DATA SWITCH CORP	5- 41	5 1/4	- 1/4	-4.5
O	DATUM INC	5- 17	7	- 1/8	-1.7
O	DECISION DATA COMPUT	9- 19	14 1/8	-1 5/8	-10.3
O	DOCUTEL-OLIVETTI	3- 39	5 1/8	0	0.0
N	ELECTRONIC M & M	5- 9	8 3/4	0	0.0
O	ENDATA, INC	5- 16	5	- 1/4	-4.7
O	EVANS & SUTHERLAND	11- 50	14	+1	+7.6
O	GANDALF TECHNOLOGIES	7- 14	7 3/8	- 3/4	-9.2
N	GEN'L DATA COMM INC	13- 20	13 3/4	- 5/8	-4.3
N	HAZELTINE CORP	23- 33	25 1/2	- 3/4	-2.8
O	ICOT CORP	3- 8	4 7/8	0	0.0
O	INFORMATION INTL INC	10- 18	13 1/2	0	0.0
O	INTECOM INC	6- 21	6	+ 1/4	+4.3
O	INTEL CORP	25- 45	27 1/2	0	0.0
A	LUNDY ELECTRONICS	7- 13	12 5/8	0	0.0
O	MEGADATA CORP	3- 8	5 7/8	- 1/8	-2.0
A	MSI DATA CORP	9- 19	9	- 1/2	-5.2
N	NASHUA CORP	19- 29	26	+ 3/4	+2.9
O	NETWORK SYSTEMS CORP	16- 34	24 1/4	+ 3/4	+3.1
N	NO AMERICAN PHILIPS	30- 45	39 1/2	+ 3/8	+0.9
N	NORTHERN TELECOM LTD	30- 42	35 1/2	+1 1/4	+3.6
O	OMFX	1- 6	1/8	0	0.0
N	PARADYNE CORP	11- 18	14 1/4	+1 3/8	+10.6
A	PENRIL CORP	9- 14	13	+1	+8.3
N	PLESSEY CO (ADR)	20- 35	23 1/4	+ 3/8	+1.6
O	PRINTRONIX INC	13- 34	12 3/4	-1 1/4	-8.9
O	QMS INC	8- 17	12 5/8	0	0.0
O	RAMTEK CORP	4- 23	4 5/8	0	0.0
N	RECOGNITION EQUIP	10- 17	11 1/8	- 1/2	-4.3
N	SANDERS ASSOCIATES	32- 51	37 3/4	0	0.0
O	SCAN-TRON CORP	9- 19	10 5/8	-2 1/4	-17.4
N	SCIENTIFIC ATLANTA	8- 14	10 3/4	0	0.0
O	SEAGATE TECHNOLOGY	4- 20	6 7/8	- 1/8	-1.7
N	STORAGE TECHNOLOGY	2- 12	2 1/2	- 1/2	-16.6
O	SYKES DATATRONICS	1- 13	7/8	- 1/8	-12.5
A	T BAR INC	7- 11	8 1/4	+ 1/4	+3.1
A	TAB PRODUCTS CO	13- 20	18	- 1/2	-2.7
O	TANDON CORP	6- 35	5 5/8	0	0.0
A	TEC INC	8- 12	11 5/8	+ 5/8	+5.6
N	TEKTRONIX INC	52- 68	57 3/4	- 3/4	-1.2
N	TELEX	19- 47	40	+ 3/4	+1.9
O	TESDATA SYSTEMS CP	2- 17	1 3/4	+ 1/4	+16.6
N	TIMEPLEX INC	13- 23	15 1/4	-1 5/8	-9.6
O	VISUAL TECHNOLOGY	2- 26	1 3/4	0	0.0
	SUPPLIES & ACCESSORIES				
N	AMERICAN BUS PRODS	17- 27	26 3/4	- 1/8	-0.4
N	BARRY WRIGHT	21- 33	21	-1 1/2	-6.6
A	DUPLEX PRODUCTS INC	22- 31	31 1/4	+ 3/4	+2.4
N	ENNIS BUS. FORMS	18- 38	34 1/2	+ 1/8	+0.3
N	3M COMPANY	69- 86	80 5/8	- 3/4	-0.9
N	MOORE CORP LTD	35- 53	50 1/8	- 1/4	-0.4
O	STANDARD REGISTER	27- 57	52 3/4	-2 3/4	-4.9
N	WALLACE COMP SERVICE	23- 38	35	+3	+9.3

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